

INCORPORATING
**SHOPPING
EXPRESS**

Thousands
of computer
bargains

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COMPUTER **EXPRESS**

BRITAIN'S BIGGEST SELLING COMPUTER WEEKLY

AMIGA

- A1500 kit on trial
- Wipe Out reviewed
- Graphics upgrade

ST

- Harlekin multi-DA
- Dragon's Breath
- Comms updates

PC

- VGA colour LCD
- Micro Eye multimedia
- New notebooks

ARCHIMEDES

- Acorn CD-ROM
- Apocalypse game

SAM COUPE

- ROM chip update

**BBC•C64•MSX
SPECTRUM•QL
XE•CPC•PCW**

SPECIALIST COLUMNS

AMAZING AMIGA!

Commodore's stunning low-cost
graphics workstation is here **page 2**



THE ULTIMATE IN MULTIMEDIA



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system will be
cheap enough
for every home
to have one **page 3**

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Sharp stays sharp

Sharp has introduced a series of impressive PC compatibles ranging from ultra-thin PC laptops to heavy-duty 'transportables'. For the first time the company has also shown off its developments in colour LCD technology.

The 10-inch thin film transistor LCD screen is still a year away from completion, but it marks a radical improvement in portable screen technology. The full-colour screen offers superb high-resolution VGA graphics which, unlike many LCD screens, can be viewed from an extreme side angle. When it arrives it will probably cost around £1,500.

The company's new A4-size notebook PC - the PC-6220 - weighs 2kg and comes with a 286 processor. It comes with 1Mb of RAM, expandable to 3Mb, and runs at a maximum of 12MHz. The 20Mb internal hard disk boasts an average access time of 23 milliseconds.

Sharp reckons the machine has the best in available LCD technology. Not surprisingly the price reflects that - £2,600.

• Colour LCD: 60-degree vision angle.



New machine has the power to beat the big boys

AMIGA 3000 TAKES ON WORKSTATIONS

On a Which Computer? Show stand costing half a million pounds, Commodore last week unveiled its new Amiga 3000 range.

Billed as a 'high-power multi-tasking graphics workstation', the 3000 represents the biggest refinement of Amiga technology since its launch five years ago. It features a fast 68030 processor, a complete update of AmigaDOS with improved icons, a new de-interlacing display enhancer, a full 32-bit expansion bus and new custom chips.

In addition, a CPU expansion slot ensures the 68030 can be exchanged for 68040s and RISC processors as and when they arrive.

The 3000 range comprises three versions - the 16-40, with a 68030 and 68881 co-processor running at 16MHz with a 40Mb hard disk; the 25-40, based on the faster 25MHz 68030 and 68882 processors also with a 40Mb hard disk; and the 25-100, featuring 100Mb drive. All offer 1Mb of chip RAM expandable to 2Mb on-board, and 1Mb of fast RAM expandable to 16Mb.

Prices for the three models start out at £2,875 for the 16-40 and rise to £3,800 for the 25-100.



• A3000: the ultimate Amiga.



• Half a million pounds: Commodore's Which? stand.

Described by UK boss Steve Franklin as "a bridgehead into a new era", the launch marked the start of Commodore's bid to capture the middle ground in the graphics workstation market. With bridgeboards and emulators allowing the new machine to run IBM, Apple, DEC, and Unix operating systems, Franklin expressed his determination to "win a major share of the business market".

CEREMONY

This was reflected in an unveiling ceremony which pitted the 3000 against high-end Apollo and Sun machines, costing £10,000 and £17,000 respectively, each running the same X-CAD Professional demo. The 3000 comfortably outpaced both machines and went on to show an impressive 30 frames per second, solid three-dimensional journey through the stand surrounding it.

Beneath the 4,096 colour, 1,280 x 512 resolution graphics, lies a brand new,

fully C-based, Workbench front-end utilising drop shadow icons with editable colour, fonts and type sizes. New system utilities and an enhanced CLI, along with the inclusion of the interface standard A-Rexx, all combine to give the 3000 the look and feel of a NeXT or Mac.

Although the Amiga 3000 is being pitched by Franklin as "the first true standard of configurable multimedia machines to hit the market", Commodore's Jennifer Perry stressed the 3000 is intended as a "graphics workstation first".

As it will run both DEC and Unix operating systems, and Commodore claims the CAD market is increasing at a rate of 100 per cent each year, it would seem that multimedia applications will still be some time arriving. Much will depend on how the new authoring system to be bundled with the machine, AmigaVision, is taken up by developers, but the package certainly looks impressive, enabling easy audio-visual scripting and sequencing.

Affordable Compact Disc Interactive system aimed at home leisure

PHILIPS BRINGS MULTIMEDIA TO THE LIVING ROOM

The revolutionary CD-I system will be available in the UK late next year for between £600 and £700, *Express* can reveal.

Jointly developed by Philips, Sony and Matsushita – the world's three largest consumer electronics companies – Compact Disc Interactive is a multimedia system which combines text, sound and pictures on a single 650Mb CD.

Significantly, up to one hour of moving video can also be stored on the 5.25-inch CDs and displayed through a standard television. As such, the system opens up tremendous opportunities for leisure, education, training and simulations applications, and is configured for would-be authors to produce their own program material.

Although Philips chose to launch the CD-I system at last week's *Which Computer? Show*, the country's leading business exhibition, CD-I is specifically targeted at the leisure market. As the system can also play audio CDs, the intended price-point should ensure massive sales into the home market – particularly as the unit is designed to sit alongside hi-fi equipment and run through conventional televisions.

At the heart of the two module system is the multi-media controller (MMC) which provides system control and signal processing, and features ports for RS232 communications, printer, keyboard and joystick besides video and audio input/outputs.

A built-in 'personal memory card' slot

allows users to safeguard program material, input their own data and store personal information.

The 1Mb MMC connects to the CD-I player module which houses the CD drive. All user interaction is achieved either with a mouse or an infra-red remote control incorporating on-screen cursor control via a tiny joystick.

An as-yet-unpriced optional expansion module provides twin 2Mb 3.5-inch floppy drives for program data storage, a built in modem, and hard disk, SCSI and Ethernet interfaces. This module allows program developers to convert both Macintosh and PC image, graphics and sound files to CD-I format via two software based CD-I Author packages.

A stand-alone low-cost editing and



• Philips CD-I: will prove to be the biggest single event in computing in the 1990s.

authoring platform is also available which features the 256-colour CD-I Paint, Audio and Video Sequence Editor and CD-I Navigator software for complete interactive program development. This should ensure that there is plenty of software.

Just to complete matters, Philips also offers a CD-I Emulator for the Sun Sparc 1 graphics workstation for high-resolution CD-I disc building.

Already just about every leading leisure software company in Europe and the USA is known to be developing CD-I titles – indeed Philips has gone so far as to set up a CD-I production facility at one of its UK sites in Dorking and is inviting potential publishers to co-operate on joint ventures.

Meanwhile, the company has tied up publishing deals with several top publishing groups including Time/Life, CBS, Columbia and PolyGram, along with leading international television companies and museums.

Multimedia: the buzzword becomes reality



• IBM's DVI – real-time digital video.

For the first time at any major computer show, the fledgling area of multimedia had its own space set aside at the recent *Which Computer? Show*.

Although only a dozen companies were exhibiting their wares, the products and applications on show eclipsed most proceedings elsewhere. Besides the low-key but massive excitement generated by the Philips CD-I system, IBM made its only appearance with its AVC, M-Motion and DVI cards. While AVC provides still video and audio digitising for presentation applications, M-Motion provides full motion video display on PS/2 VGA screens.

The most revolutionary though is DVI, which allows compression and decompression of moving video so that material can be digitised and manipulated in real time.

At a more affordable level was the Micro Eye suite of multimedia products for the PC from Digithurst, on 0763 242955. Image grabbers and video cards are able to capture still and moving video for reworking in the company's *Picture Book Professional* software. This is a sophisticated hypertext database which provides scalable windows containing video, graphics and text linked to each other along associated pathways.

Acorn multimedia CD-ROM

A multimedia package from Acorn and Next Technology will bring high-storage CD-ROM to the A3000 and Archimedes computers.

The CD-ROM drive has applications in education, training and presentation, and enables presen-

tations to be made with a mixture of computer graphics, digitised sound, video and digitised pictures.

As well as the drive and software, Next provides the facility for customers to produce their own discs.

The complete system costs around £2,000, with add-ons for existing machines at around £600 plus the cost of a SCSI card.

More information from on the system can be had from Next on 0223 420222.

Travel without leaving home with Autoroute graphics

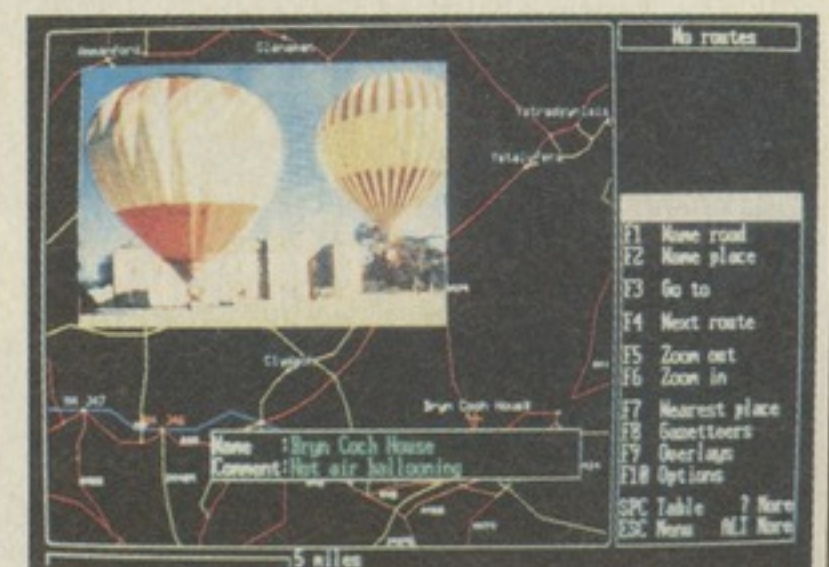
The computerised road atlas and planning system *Autoroute Plus* now can have pictures built in to illustrate routes, and soon will have versions for European travellers.

A French version is almost with us and American and Italian versions are expected by the end of the year. There is even talk of a German one.

With all this going on, you could forgive publisher NextBase if it hadn't had time to work on the British one, but at the *Which Computer? Show* NextBase announced a picture module for the *Autoroute Plus* Gazetteer Editor.

The module allows digitised pictures to be added to the map. The pictures can be popped up with a location and used to enhance the gazetteer.

As well as commercial uses in tourist



• Autoroute graphics: picture your destination.

offices and estate agents, it could be an ideal holiday planner.

A trip could be planned and all of the places of interest viewed before *Autoroute Plus* organised an itinerary and an optimised route. More details from NextBase on 0784 460077.

Printing on the quiet

Two extremely quiet printers which take their paper from slot-in cassettes to avoid manual loading have been launched by Mannesman Tally.

The MT130/9 and MT131/9 are 80- and 136-column dot-matrix printers aimed at business users who want a low-cost option for PC applications.

Both machines are quiet for dot-matrix printers, putting out only 53dB in draft mode. Prices are £459 for the 80-column model and £559 for the 136-column one. A serial interface costs an extra £25 and there's a colour version for an extra £100. More information from Mannesman Tally on 0734 788711.

All-in-one software and hardware solution for £1,500

CANON'S BUSINESS SYSTEM DUE IN UK

Canon has confirmed that it will be launching its all-in-one business computing system in the UK.

The machine, which incorporates a 286 computer, printer, telephone, answering machine and fax in one box, has been sold in Japan for the past year under the name Navigator (Express 43). Here it will be called the Canon S-2000.

At one stage the firm had been doubtful as to whether or not to launch in Europe, but interest generated by publicity from the machine's success in the Far East has prompted a re-think. Last week at the *Which Computer?* Show in Birmingham a large stand featured half a dozen S-2000s.

As yet prices have not been fixed, although something in the region of £1,500 is likely. Given the features it

boasts this is an excellent buy for home and business users.

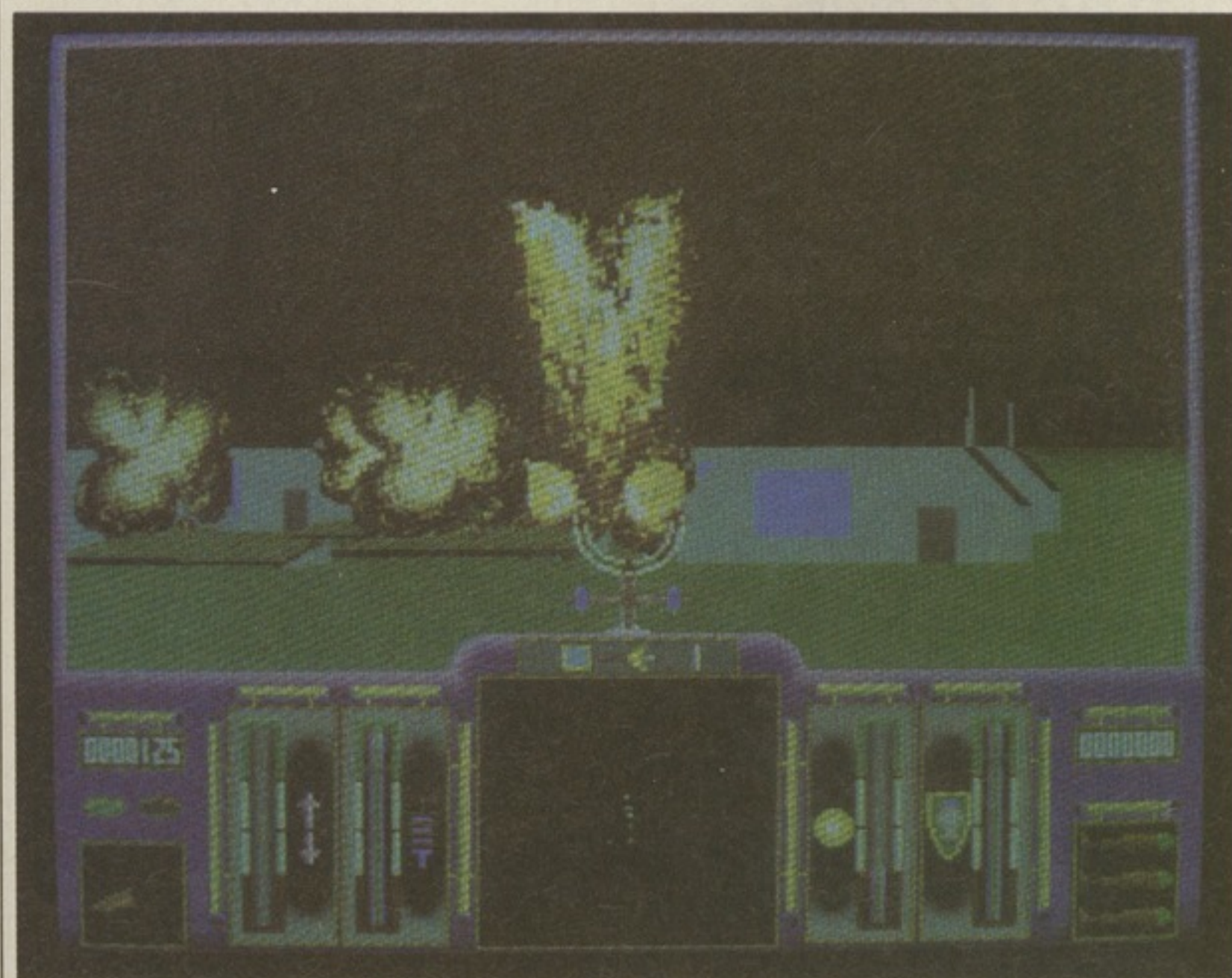
Also, the company has hinted that it will be working on enhanced versions which will probably utilise 386 technology. The entry-level system will be available here by November with top-end versions following early in 1991.

As it stands the S-2000 features 3Mb of ROM and 1Mb of RAM, a 3.5-inch disk drive and the option of a 20Mb hard disk. Fax messages can be sent or received without paper. The icon-based machine also incorporates touch screen technology, and the keyboard can fit neatly into a slot underneath the monitor.

Canon will probably be launching the machine with a bundle of business software including a spreadsheet, database and word processor. ■



• S-2000: high profile UK launch.



• Apocalypse: pushing Archie games to the limits.

Stretching the Archie

Apocalypse, a new game from Archimedes games publisher 4th Dimension, will stretch the Archimedes to its limits, claims the software house.

The shoot-'em-up takes you over the surface of a planet, killing everything as you go.

The firm reckons the game would only run on an Amiga if it had extra RAM, a turbocharger and a couple of Spectrums bolted on for good measure. Not surprisingly perhaps, there are no plans to release the game in other formats.

A spokesman for 4th Dimension said: "This is the game that will make Zarch look like an early version of Pacman."

More info on *Apocalypse* and other Archie releases from 4th Dimension on 0742 700661. ■



• Schneider's 486 - a cheaper option?

Cheaper 486 out soon

Schneider is planning to launch a competitively priced 486 PC before the end of this year.

As yet details are scant, but the firm's main areas of success lie in the low-cost computing. Schneider is hoping to introduce a machine which will be affordable to business buyers looking for a realistic 486 option.

The Schneider 486 will be cased in a stylish black and grey casing, and should be launched in October. ■

Batch of PCs launched

At last week's *Which Computer?* Show, PC manufacturers Viglen, Wyse and Elonex were three of the firms with new PCs to announce.

Viglen launched the Genie, claimed to have the smallest footprint of any IBM clone. It comes in 286- or 386-based models with prices from £849 for the 286 and from £1,159 for the 386. Viglen is on 01-997 3000.

Wyse also released a 286 PC. The WY2012i is targeted at low-end businesses, but the system is flexible and can be expanded to suit any application. Prices start at £995 for an entry-level machine. Wyse is on 0734 342200.

A little faster on their feet are the 386 and 486 models from Elonex. A little more pricey too, with 386 versions starting at £2,495, they are quick with a 33MHz 486 model coming with 8Mb of RAM and a 100Mb hard disk for under £5,000. Elonex can be reached on 01-965 3225. ■

Planet in the balance

Balance of the Planet, the follow up to world domination saga *Balance of Power* was released on Earth Day (April 22).

Instead of trying to survive in a political arena, this time it's your job to keep up industrial production while cutting back on pollution. The PC game costs £39.95 and for each copy sold a donation will be made to the Tropical Rain Forest Appeal. Details on 01-585 3308. ■

Panasonic joins the notebook brigade

Panasonic has launched a slimline notebook PC with an entry-level price of £850.

The CF-150B runs at 8MHz and comes with 640K of RAM expandable to 1.6Mb. The backlit supertwist LCD measures 192mm x 118mm and boasts 640 x 200 pixels.

Panasonic has included a number of useful slots including RS232 and parallel interfaces as well as expansion slots for an internal modem card and a 1Mb RAM card. It comes with MS-DOS 3.3 and GW BASIC.

An LED indicator signals battery depletion - the internal power supply comes from a lead rechargeable battery which can run for one hour flat out, or for four hours without the back light. The whole thing weighs 2.8kg. ■



• CF-150B: low cost option from Panasonic.

A peek at the cyber future

Life in the 21st Century will be governed by computers and technology, but there will be serious ethical dilemmas, according to futurist McKinley Conway.

He has published a series of predictions in the periodical *Site World*. The article was originally compiled for corporate planners and economic development companies.

His view of the next century includes:

- Computerised motorways with cars driven by robots
- Scientifically-controlled weather allowing the control of hurricanes and other extremes.
- Direct links between the human brain and computers allowing for the upload of a person's dying thoughts.
- Electronic scanning to decide when crops are ripe.
- Use of computerised sensors to detect drug use or disease, replacing the humble urine sample.
- Wireless electric power to extend transmission lines
- Strict government birth control programs with penalties for families who have too many children. ■

TV screen flicker fixer

A British company has found a way of fixing that irritating flicker that you see almost every time a computer screen is shown on the TV.

The Shutter is a completely portable LCD shutter device that attaches to the video camera and allows synchronisation with any monitor in the shot.

Up to now the equipment needed to synchronise the frame rates and fix the flicker could be expensive and cause sound synchronisation problems.

At only £1,800 including modifying the camera, no TV or video company has an excuse for flickering pictures any longer. ■

Manual labour

Plain English manuals with simple illustrations and no clutter are on the way.

A project by graduate students at Carnegie Mellon University in Pittsburgh is leading the way toward clarity after years of inadequate and virtually unusable manuals.

Mitsubishi has grasped the results of the research and is gradually phasing in new 'readable' manuals for its electronics and audio/visual products. ■

Fax facts

Thinking of buying a fax machine? Amstrad has launched a low cost £399 machine called the FX-5000. There's also a £599 FX9600AT which includes internal answering machine.

At Which? the firm also showed its new portables, unveiled earlier in Germany. ■

ROM change is simple enough for anyone claim MGT ASKS OWNERS TO CHANGE CHIPS

MGT has reversed its decision to have faulty SAM Coupé ROM chips exchanged by dealers, and is soon to ask owners to open up their machines and change the faulty system ROMs themselves.

The firm had planned to issue a statement to the 8,000 or so owners directing them to their nearest dealer who would then change the rogue chip (Express 75). However, it will now send out new chips to all existing owners with directions on the operation.

The firm says opening the machine for this purpose will not adversely affect the warranty.

Opening the case of a home computer is usually an automatic warranty invalidation. Manufacturers openly dissuade end users from meddling within by withdrawing the guarantee if an owner has 'been inside' the machine.

The new ROMs for the SAM Coupé are being installed in the production machines, and upgrade kits for present owners are on the way.

MGT boss Alan Miles said: "All new Coupés have the ROM and we're sending



• Coupé: opening it up will not invalidate guarantee.

the new ROMs to everyone that's returned their guarantee card."

The firm feels that owners can handle the operation themselves and fears that directing thousands of users to dealers will be a damaging task.

Miles confirmed that the ROM

change operation was a simple job and should be within the capabilities of a Coupé owner but added: "If anyone doesn't feel competent to carry out the job, they'll be able to take the Coupé to their nearest dealer and have the job done free of charge." ■

A PC IN DRAGON'S CLOTHING



• Stick on furry legs, heads and arms are the latest in software for the PC. Memory specialist Datrotech launched the four 'Critters' at the Which? Show last week.

The add-ons are a rabbit, teddy bear, bulldog and dragon. More details from Datrotech on 0252 313155. ■

US-USSR link

The joint US-USSR venture to provide over six million computers into the Soviet Union may be threatened with funding problems.

Phoenix International, the US end of the deal, is openly admitting cash flow problems but denies the deal is in jeopardy. A Californian newspaper reported that Soviet officials had said that the deal was off until Phoenix found more money.

Charles Missler, a Phoenix vice president, said: "The Russian deal isn't dead. We have more going on with the Russians than ever before."

Phoenix has dismissed eight employees, and the company president has put \$500,000 of his own in to keep the company afloat. ■

Get the drift?

A new Mac virus called Zuc, which causes the cursor to drift diagonally across the screen, has appeared recently.

The virus, first spotted in Italy, makes the cursor drift until it reaches the edge of the screen, and then nullifies cursor control. This is the 15th reported virus for the Mac, although it isn't destructive or malicious. If you think you're affected by Zuc, Micracom's Virex virus killer will lay it to rest. Micracom is on 0483 740763. ■



• BSB's spaceman launches computing show.

Micro show in space

Satellite TV station BSB is to screen a series of programmes dedicated to computing.

The Computer Channel will be divided into two parts – a weekly news programme and a series of seminars and training events. It will be concentrating on such subjects as networks, disaster recovery, operating systems, CAD and information technology management.

The editor, Clive Couldwell, comes from the influential magazine *Which Computer?*, where he spent more than four years running the publication. The Computer Channel comes as part of the BSB subscription (which costs £495). It will be screened on Wednesday and Thursday mornings. ■

Making life easier

A PC DOS shell that could make the accidental erasing of important data less likely has been released by Mindscape.

Sizzle is an environment which handles file management and housekeeping on your PC, but only takes up 22K of RAM.

The pop-up menus allow full use of DOS while making tasks like installation and file management easier and safer.

The utilities menu includes many of the commonly used DOS commands and any program run from an EXE file or batch file can be run from within Sizzle.

More details from Mindscape on 0444 86 545. ■

Shop your teacher for £1,000, demands campaign REWARD OFFERED FOR CATCHING PIRATES

The European Leisure Software Publishers Association (ELSPA) has joined up with FAST to set up a Computer Crimewatch telephone line with cash prizes for information.

They are hoping that the response to the rewards will help to bring pirates and software thieves to the courts.

Comic-style adverts for the campaign show computer users imploring friends to pick up the phone and earn up to £1,000 for informing on dishonest dealers, pirate crackers, and even school teachers who allow copying to go on.

Andrew Hewson, the chairman of ELSPA, said: "It's a long term plan aimed at educating the public and indicating the legal situation. We want people to realise that they will be punished for piracy."

He said that the industry currently gets letters and calls from people of all ages and interests from young children to adults and the crime line was a way of providing the mechanism for their comments. He added that the rewards are an incentive "for honesty" and, as well as weeding out people trying to exploit the system, he is confident that it will be a success.

The amount for each reward will be judged on the specific merits of the case with a maximum of £1,000.

FAST said that it will be acting only as an intermediary for ELSPA, and had not designed the ads.

The hotline number for contacting the campaign is 071-497 8973. ■



• Telling tales: part of the ELSPA campaign.

TALKING THEIR LANGUAGE



• A translation program to convert C source code into different European languages is Systemstar's contribution to the 1992 free market.

The Internationaliser offers automatic translation of the code no matter how many languages are supported. It scans a source file and replaces text strings from a database of foreign equivalents. This makes it possible to run the same program in as many languages as you wish to support, while only needing one 'master' of the source code. More details on 0992 500919. ■

Charity show

A computer show in Hull is to benefit Children in Need and local charities. The two-day event on June 30 and July 1 is at the Portobello Hall, Hull.

All common brands of computers will be covered, and MIDI music makers will find plenty to interest them.

Doors open at 10am and admission is £1 for adults and 50p for kids. Blue Peter badge holders will be admitted free of charge.

There will be a preview for the handicapped at 9am on June 30.

More information from Andrew Whittaker on 0482 564431. ■

Chinese handshake

Chinese universities have been given network software free by 3COM in a scheme designed to help the development of computing and communications in China.

The US company gave five universities a copy of 3COM's 3 Plus Open LAN Manager 1.1 at a ceremony in Beijing. ■

Book puts the hackers' case for beating the system

A book that follows the escapades of three computer hackers will soon be on the shelves. *Beating the System* looks at their journey through the electronic highways of the world and provides an entertaining A-Z of hacking.

The book follows their trail round the world and is told as a story. The hackers are Edward Austin Singh, an English hacker who was caught by the Secret Service and Scotland Yard in November 1988 for breaking into military and corporate systems, an American hacker whom he was working with and who had been arrested by the US Secret Service in Philadelphia, and a German hacker who was on the fringes of the hacker group that was selling secrets to the Soviets. This latter group was exposed by Clifford Stoll.

The book is a combined effort by Sally Hamilton, former features editor of *Computing*, and *Guardian* news reporter Owen Bowcott.

Intertwined with the factual accounts are chapters on the different aspects of hacking.

International hacking laws are covered in the book, pointing out that Britain is still the best place for hackers because of the lack of real laws to stop it. It also looks at the growing phenomenon of launching viruses from different countries which are interconnected by networks.

The book points an accusing finger at the people responsible for computers' general lack of security. Computer manufacturers are singled out as the culprits for designing systems based on user friendliness and networking while totally ignoring all aspects of security.

Other chapters look at the history of hacking, the hacking sub-culture, the future of computer security systems, and hacking fraud.

Owen Bowcott told *Express*: "Hackers and fraudsters aren't the same people. There are very few cases where hackers become fraudsters. People who are hackers are hackers because they enjoy it. The vast majority of people who commit fraud just happened to use computers."

"We have pointed out that the people who are pressing for legislation are blackening the name of hackers by associating them with every bad thing that is done with computers, which isn't the case."

The book also covers aspects of computer privacy, and the Metropolitan police's involvement in fighting computer crime. Also detailed are computer firms that specialise in breaking into other companies' computers.

The authors take a close look at the infamous West German Chaos Computer Club, based in Hamburg, pointing out that the press over here and in the USA portrays them as mindless computer vandals.

This is not the case, the book contends, and continues to explain the CCC's philosophy of 'keeping public data open, and protecting private data, as well as a promoting wider availability of computers to the man on the street.'

The book will be published next month by Bloomsbury and will be priced at £7.99.

Telework firm on-line

The fastest way to travel to work is by wire, and now tele-commuting may bring much wanted relief to the jobs shortage in Nottingham.

Ex-IBM manager Horace Mitchell has established a company called Frontline which aims to employ 150 information technology workers over two years, generating about £3m a year in revenue.

If all goes well the employees would be engaged in work provided by blue-chip companies from the South, linked by telecommunications across the great North-South divide.

Frontline was originally devised under the auspices of the National Economic Development Council, and if it is successful in Nottingham, the program will look to establish centres in the towns of Belfast, Doncaster and Leeds.

East Midlands Electricity, the Software Group and Nottingham Polytechnic have all claimed stakes in Frontline, while retailing giant Marks and Spencer is studying the feasibility of involvement.

Call in from the plane

New communications technology on test with the airlines will eventually allow an on-board portable computer to access other systems via a satellite phone link.

Inmarsat, the agency which provides satellite services to merchant ships, is launching six new satellites during the Nineties and these will have free 'space' for the airlines and telecommunications companies to rent.

The quality of satellite communications is so good that computer data can be sent without losing its integrity. Initially there will be a phone box aboard an aircraft that will allow users to 'swipe' in their credit card and make a call.

Racal Electronics along with Telecom and British Airways predict that within a couple of years, passengers will be able to phone from their seat in Club and First class. It is only a matter of time before the connections are included to plug a laptop and modem in directly.

Californian paper reveals Apple's secret plans

TALKING NOTEBOOK MACINTOSH RUMOUR

Apple is rumoured to be working on a notebook-sized version of its Macintosh computer.

According to *The San Francisco Chronicle* the company's development team are involved in putting together an A4-sized machine which will use a stylus instead of a mouse.

The project - codenamed Paradigm - will be able to recognize handwriting. This is clearly a sophisticated piece of hardware and the finished product may be two years away.

The Chronicle claims that Apple is, for the first time, working with a reduced instruction set computer (RISC) and that the RISC chip involved is a Motorola 88000.

Apple sources told *The Chronicle* only a few engineers and managers are working on Paradigm.

It is understood that Andy Hertzfeld - who helped with the development of the original Mac - could be on the team along with respected technologist Bill Atkinson.

According to the newspaper: "To make the device really friendly to users



• Macintosh: user-friendly notebook.

the machine's display screen may feature the image of a talking head that could be programmed to audibly provide informa-

tion." Apple is at present refusing to comment on what it describes as a piece of pure speculation.

Flying fonts for WordStar

A new version of the classic PC program WordStar has been released, featuring typefaces and point sizes which can be selected on the fly.

The industry standard word processor, now on its sixth version, can define fonts in any size, from too small to read to letters a foot high. Instead of having to pre-define these, they can be defined as and when required in increments of a quarter of a point.

Kerning is also supported and WordStar claims that the quality of documents is limited only by your printer's abilities.

Further features are expanded support for HP LaserJet and PostScript users, allowing them to access font shading. WordStar 6 costs £459. Contact WordStar on 01-643 8866.

Cash in hand

An accounting package for traders who deal only with cash has been released by Sage.

Sterling Cash Trader is for businesses which generate most transactions and income from cash and cheques, and which don't normally operate credit facilities.

It is available for the PC with ST and PCW versions to follow. The PC version costs £99. More on 091-213 1555.

COMMENT

We won't stop piracy by clamping down on advertising, what is needed is stricter action against those who are caught...

Piracy features heavily in this week's Express Mail pages, and a couple of difficult points are raised in the course of that discussion.

The subject of *Express* taking advertising for disk-duplicating hardware/software is one of those dilemmas, and was largely dealt with in a letter answer, but I shall mention it again.

At least as vexatious is the recurring problem of the abuse of the readers' free ads pages in Shopping Express. After complaints that the contacts section was being used by a number of pirates to pursue their jolly-rogering activities, I stated in a recent Express Mail response that I would drop that section entirely if readers did not use the offer responsibly.

Subsequent reader correspondence indicates that this problem is never likely to go away of its own accord; on the other hand C D Palmer makes an impassioned appeal in this issue's letters for retaining the free ads service, pointing out that he had made a number of legitimate contacts through those pages.

Used in the way that the people mentioned in this letter have done, the contacts are actually beneficial to the software industry — members of this loose-knit group individually evaluate games and then recommend to each other titles which all of them then buy and compare notes on.

While we still intend to screen free ads a little more closely than has, regrettably, been the case, there are inevitably limits. To exclude all ads carrying the word 'contacts', for example, would punish the innocent as well as the guilty, and new code words for 'I am a pirate' would soon be established.

Thorough vetting of the free ads, with check-backs on advertisers, is unfortunately not feasible. It is fairly obvi-

ous that running the service at all costs *Express* money to do and generates no visible income. Any further commitment of staff time to the pages would probably make the service financially unviable.

With the launch of ELSPA's latest anti-piracy initiative (see page 6), the time has come where we must ask honest readers to help out in policing these adverts by reporting to the Federation Against Software Theft the names of individuals and groups involved in piracy.

I realise that some will feel that taking reward money for helping to clean up piracy is unacceptably mercenary; I hope that those readers will find it more altruistic to help save the free ads service from disrepute and subsequent oblivion.

COSMETIC

It is neither pure greed which makes me reluctant to prevent copying systems being advertised nor pure indolence which prevents me from closing down the free ads. The first action would, I feel, be cosmetic, while the second would deprive the innocent to spite the guilty. Neither move would, in my opinion, have a substantial deterrent effect.

Surely the most effective way to make software pirates think twice is to start making exemplary arrests and prominently publicising convictions arising from them. Petty pirates will surely stop placing their ads in Shopping Express once they realise that to do so is to lead FAST straight to their door.

Over the next few days I shall be making it clear to both FAST and ELSPA that far from regarding the policing of our pages in this way as being intrusive, we at *Express* would positively welcome their help in cleaning up a service we very much wish to continue supplying.

Martyn Lester

FROM The ARCHIVE

ONE YEAR AGO

Sir Clive Sinclair predicted that computerised motorways would eradicate the need to drive. Sinclair's report, entitled *Traffic in the City*, predicted that drivers would simply drive on to the motorway and go into auto-pilot — the system would then take over. He didn't say whether or not the ill-fated Sinclair C5 tricycle would play a part.

Bulletin board owners threatened to 'MUG' Tory MP Emma Nicholson for her anti-hacking bill. 350 boards formed the Modem User Group (MUG) in an effort to protect innocent users that they claimed would be an easy target for the campaigning MP.

Organiser Noel Bradford wanted a meeting with Emma to see how far she was prepared to go. A year later there are still at least 300 operational bulletin boards in the country and, despite the local crack down on hackers and phreakers, they look safe for now.

British PC firm Opus rubbed its hands with glee as it carried away a lucrative contract to supply British Rail with 3,000 PCs. British Rail needed them for a variety of jobs including word processing, accounts and customer services.

Russian schoolkids on an exchange visit with Cranford School in Dorset were impressed with the Archimedes and Apple Macintosh computers but a little bemused by the BBC Bs.

US Gold found that an old double decker bus was just the ticket for a summer tour to show gamers what to expect in the autumn. The bus was to visit venues in areas where people may not have had a chance to visit a computer show.

Oxfam appealed for software to sell for charity. They wanted users to take their old software to Oxfam shops. It was then

sent to London to be sold through special centres during the summer.

Atari released its £399 ST Powerpack, claimed to be the best value bundle ever, with £555-worth of software included. This meant that, in theory, you got a discount of £255 on the software and the computer was thrown in for free... Honest!

40 per cent of British companies admitted being worried about recruitment of computer staff over the next few years. One year on, companies still claim to be having trouble finding staff and computer literate people claim to be having trouble finding work. Will someone please introduce them?

TWO YEARS AGO

Atari rushed to its own defence after High Street chains feared that the Summer Pack ST bundle could cut a swathe through software sales at a time of the year when games sales were traditionally slow.

Atari said emphatically that no one was going to see higher software sales in the summer based on a stand-alone ST deal, and that it wasn't hindering anyone's ability to sell software.

CodeMasters claimed that advanced orders for the charity game *Race against Time* had reached over 20,000. The game was launched on *Get Fresh*, a Saturday morning TV programme, and the proceeds went to Sport Aid.

17,000 people swarmed through Alexandra Palace for the weekend's Atari User Show. This was twice as many as had previously attended an Atari show. There were queues outside the building all weekend and stallholders were having to send away for stock replenishments.

Although Atari didn't have a stand of its own (whoops! red faces) its brass turned up for the ST Summer Pack launch.

Tandy bared its teeth at 'Big Blue', IBM by using its existing patent licence to clone IBM's PS/2. The Tandy 5000 range incorporated high speed memory, advanced graphics and microchannel architecture and cost \$4,999

Sources: *New Computer Express*, *MicroScope*, *Computer Trade Weekly*

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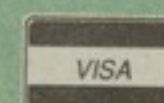
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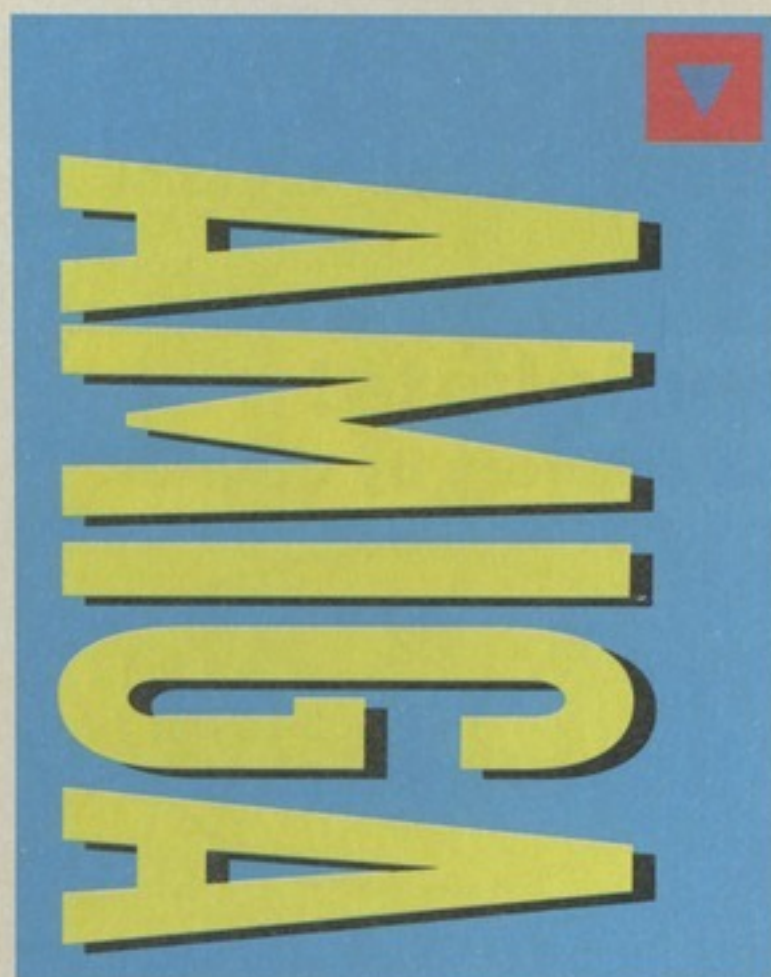
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MILLION COLOUR QUESTION

Black Belt Systems in the States has developed a handy little widget that gives your Amiga three new graphics modes. The gadget plugs into your Amiga's RGB port and can be used with any standard Amiga monitor.

The device works with all Amigas and provides a 256 grey scale mode (from a palette of 256 colours), a 256 colour mode (from a palette of 16 million colours) and a new extended HAM mode called HAME (from a palette of 16 million).

With HAME, you get 262,144 colours on screen at once with 236 colour registers available (as apposed to the usual 16 HAM colour registers).

The device works by taking a four bitplane high-resolution screen and breaking it down into an eight bitplane low-resolution screen. Since the screen is still a standard high resolution Intuition screen, it can still happily be used with other programs within the multi-tasking environment.

Not only this, but the device works well with both overscanned and interlaced screen modes, thereby making the device ideal for the Amiga's work within the video industry.

Most slideshow programs will be able to display pictures that use the new screen modes without problems. However, programs that produce image files (such as paint packages, etc), will have to be modified to take advantage of the yet-unnamed gadget. Black Belt hopes that many leading software packages may be re-issued in a compatible form to take advantage of what is indeed an exciting product.

AMIGA AUTOROUTE

Sky Shephard Software in the States has announced the release of *Trip*, an Autoroute look-a-like for the Amiga.

Trip is a powerful database that will calculate the estimated travel time and distance time, and will calculate and display the shortest route between two points.

Unfortunately, the program currently only covers the United States and southern Canada, but it is believed that Sky is hard at work producing versions for the European marketplace.

In the meantime, perhaps NextBase would like to put us all out of our misery by producing an Amiga version of the successful *Autoroute* program?

SNIPPETS

• Ever wanted to control electrical devices within your home from your Amiga? Thanks to Digital Dynamics in California you can with the Ami-X10 control software.

The Ami-X10 is a combination of software and hardware to allow you to control virtually any electrical device with

your Amiga. The package consists of an X-10 control box that can be programmed from the Amiga to switch devices and on/off at any specified time. Once programmed, the X-10 interface will happily continue to function without the Amiga even being turned on.

• Solid State Leisure has dropped the price of its long-awaited 68020 processor accelerator, the 20-CARD to £349, a savings of £50.

According to Solid State, the drop in price has been made possible by a reduction in the cost of many of the board's major components. Solid State can be contacted on 0933 650677.

AUDIOMASTER UPGRADE

Aegis' *AudioMaster II* is undoubtedly the most powerful sampling software available for the Amiga. According to a US source, the developer of the program is soon to release a vastly upgraded version of the program in the form of *AudioMaster III* (well, stone me if that's not an imaginative name).

According to our source, this latest release will feature significant enhancements that will make the last upgrade look like nothing more than a bug fix. I for one can wait!

On the subject of *AudioMaster II*, Omega Projects has started bundling its popular *SoundTrap III* Amiga sound sam-

pler with Aegis' powerful sample editing software.

The new bundle is available from Bytes & Pieces for £59.95, which is the cost of the *AudioMaster II* software alone. Can't say fairer than that, John John. Bytes & Pieces can be contacted on 0253 734218.

TWO PORTIONS OF CHIPS

After only just getting over the shock of how useful having 1Mb of chip RAM can be (how did we ever manage without it), it seems that Commodore may surprise us all by knocking the available chip RAM up to a maximum of 2Mb, just like that found within the new (and incredibly sexy) Amiga 3000 – someone please buy me one now.

According to a well-known American publication, the schematics for the latest revision 6 A500 board reveals that there is a configuration in which 256K x 4 memory chips can be replaced by 1Mb x 4 (as used within the new A3000), to knock the total amount of chip RAM up to a full 2Mb (now we're talking).

Unfortunately, you'll need a special version of Agnus, which currently is a very rare commodity indeed. And even if you do find Agnus, you'll have to own one of the revision 6 Amigas to take advantage of this feature.

Jason Holborn

PLAYING TIP

F-29 RETALIATOR

Can't land a state-of-the-art combat jet? What's the matter with you?

All you have to do is sign yourself in as a colonel with the name THE DIDY MEN, accept a mission (without selecting one), choose and accept a mission and when it comes time for you to land, just press Enter on the keypad.

Steve Murray, Liverpool

FRACTAL FANTASY

Microllusions has announced the impending release of *Genesis*, a fractal landscape generator to end them all. The program is being developed in the States by the author of Microllusions' popular video software *Photon Video*.

Although *Genesis* is still at least two months from completion, it promises to be the most powerful fractal landscape generator available for any computer. Further details are a little sketchy, but as soon as they are made available I can assure you that *Express* readers will be the first to hear. In the meantime, take a look at the screenshot.



Gonzo Games •
£19.95

How many of you remember the computerised Disney film *Tron*?

The film featured a video game wherein two 'light cycles' raced around a grid leaving fluorescent trails behind. The idea was to trap your opponent while avoiding the walls.

Several years on, the idea lives on in the shape of *Wipe Out*. The game is set in an intergalactic hoverboard championship, played between two riders in a series of different shaped arenas.

Players can buy boards before the competition, each with its own range of facilities. For example, some boards allow you to jump walls in a single bound



whereas others have better cornering capabilities.

In the arena itself, extra pickups can be gained by flying into them. These give hoverboarders the ability to get rid of walls or even pass straight through them. The gameplay itself is simple. Fly around the arena, avoid all the walls and try to make your opponent crash. Sounds easy enough? Well it would be if your opponents weren't as devious as they are! Different types of aliens and robots take part, and every one requires specific tactics to wipe them out.

The appearance of

Wipe Out isn't the most stunning the Amiga has seen, but beneath this deceptive exterior is a challenging and incredibly compulsive head-to-head action game. Even when you've beaten the league, there are many more planets to visit before you can consider yourself a *Wipe Out* expert.

Even if you don't remember *Tron* (unlike me – it's one of my favourites) you could do a hell of a lot worse than trying out this debut from Gonzo Games, as it's one of the best light cycle variations available.

Maff Evans

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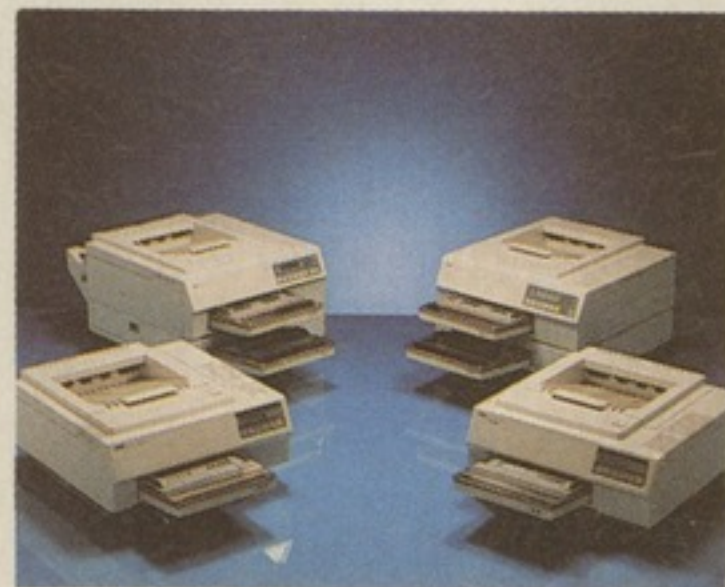
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	VGA £	
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MONO	SAMSUNG	MA 2671/3/5 FST	12"	81
MONO	AKHTER	MONO 14 FST	14"	79
MONO VGA	PHILIPS	BM 7749 FST	12" p/w	107
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EGA	PHILIPS	CM 9073	14"	289
EGA	SAMSUNG	CM 4551	14"	281
VGA	HYUNDAI	HDM 401 FST	14"	253
VGA	PHILIPS	3CM 9809	14"	372
VGA	SAMSUNG	CJ 4581	14"	281
VGA	AKHTER	VGA 14	14"	273
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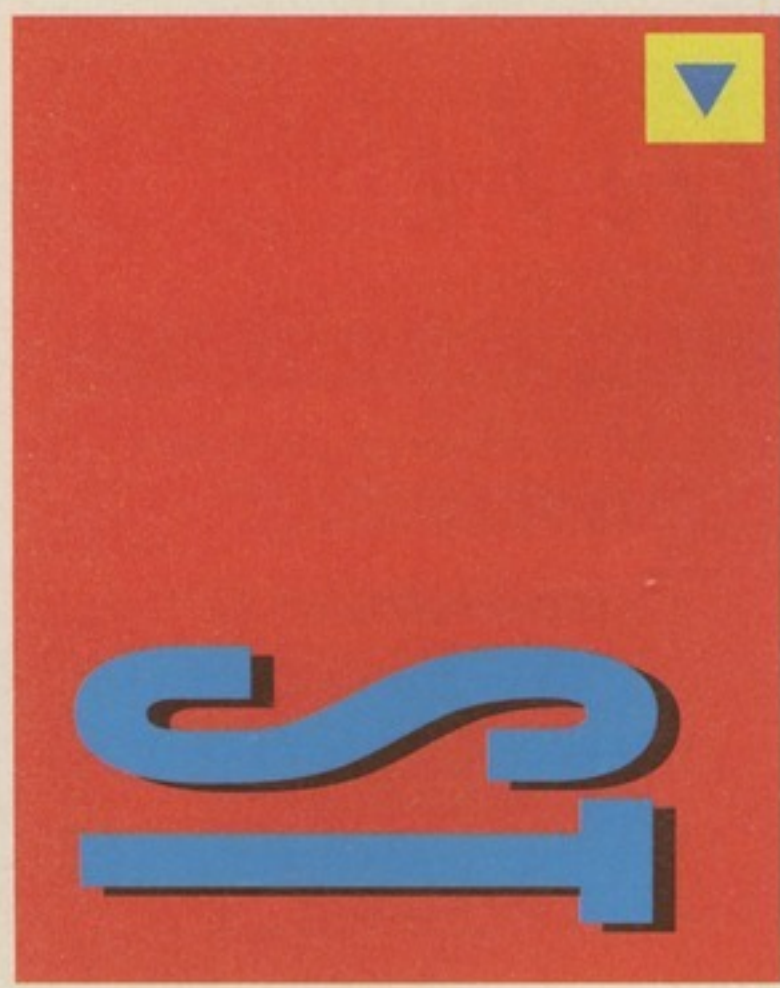
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ATARI PLEADS IGNORANCE

The news that Atari – or rather its Taiwanese subsidiary – has been charged with breach of software copyright comes as quite a shock (see *Express* 77). Judging by the angry response emanating from Atari HQ, it is clear that the seriousness of the charge is not being underestimated.

The Tramiel line – that any law-breaking has been the private activity of workers at the plant – hardly inspires confidence. And protestations that the raid was a waste of time and effort hardly sound like a considered response.

The whole sorry episode serves to underline just how serious a problem piracy is. Indeed, when we investigated the subject for an article shortly to appear in *ST Format* (for the June issue, out next Thursday), we found that there is a general feeling that software theft could pose a major threat to the future of the ST.

As readers of *Express* know, the future of cartridge- and CD-based software is looking increasingly bright. And, say what you like about the cost or limited capabilities of such hardware, one thing is already clear: piracy is not a problem.

The implications for the ST are equally clear. If software publishers feel that their efforts are going to line the pockets of others, who can blame them if they shut down disk-based production and turn to cartridges and CDs instead?

Now there's a thought, next time you're tempted to accept a cracked copy of copyright software...

TO LEND OR NOT TO LEND?

And still on the subject of breach of copyright on ST software, the Federation against Software Theft and the European Leisure Software Publishers Association (phew) are combining to clamp down on software 'lending libraries' which loan out ST software.

In fact, it's not against the law to lend software, but the permission of the producer is required first. So if you are a member – or indeed an organiser – of such an ST 'lending library,' then do please check that permission has been granted by whoever owns the rights to the programs in question.

ST COMES OF AGE

At the *Which Computer?* Show at Birmingham's NEC it was gratifying to see that Atari is starting to push the Mega range again. There was a good deal of emphasis on the Mega 4 as a cheap desktop publishing alternative to the Macintosh ('power with the price').

It's instructive to see what has happened in Germany, where there are

some half a million STs, and the vast majority of them Megs. There, the idea that anyone could buy an ST simply as a games machine seems simply not to have occurred. Instead the ST is used as a professional publishing machine, as well as for computer-aided design (CAD) and even for running factories!

And what Germany does now we British ST people will be doing soon.

HERE IS THE ST NEWS

If you're into comms (and if you don't know what comms stands for, then you're not) you may well be aware of CompuServe, the world's largest on-line information service for users of personal computers. Based in the US where they do things bigger, it has an astonishing 500,000 plus users around the world and offers some 27,000 public domain and shareware programs for the purpose of downloading.

The problem has been cost: accessing an American service can do things to your phone bill you wouldn't want to know about. Even more frustrating is the fact that CompuServe has what is generally reckoned to be the best ST information forums in the world.

Now you can find out for yourself, for CompuServe has arrived in the UK. Using local network access, costs are cut by more than 50 per cent, according to UK Manager Andrew Gray. He points out that there are three Atari forums of direct interest to readers of this column.

There's the Productivity Forum, which corresponds roughly to what we Brits usually call 'serious' software – word processing, DTP, spreadsheets, databases, that kind of thing.

Then there's the Arts and Entertainment Forum. And finally there's the Atari Vendor Forum, which puts you in touch with companies, mostly US-based, such as Codehead, Grafix, Gadgets by Small, SoftLogic and so on.

One oddity is that prices are still calculated in dollars, and while \$22 an hour (about £13) is eye-wateringly expensive, it's probably worth it if you have an automatic modem working at a decent speed (up to 2400 baud permitted). Interested? Call CompuServe on 0800 289 378.

DASH IT ALL

Microdeal's *Duplicating and Security Handler*, known simply as *DASH*, has been upgraded to provide STE compatibility. Call Microdeal on 0726 68020 for more details.

NEW PC SPEED VERSIONS

If you are forced to use a boring PC at work, then a) my condolences, and b) you can work at home on your ST, using a PC emulator. And Gasteiner has just launched two new versions, one for the Mega and one for the STE. Phone the good people on 01-365 1151.

TRASH? TRY IT AND SEE!

By the way, comms freaks will need little reminding that *Trash*, the follow-up to the highly successful *Shades*, is now available on Micronet. It makes a welcome attempt to get away from the rather anorak-tainted spells 'n' swords of most multi-user games, pitting you as a Pan-Dimensional Disposal Officer roaming the universe – sorry, multiverse.

The great appeal of games like *Trash* and *Shades* is that your actions directly affect, and are directly affected by, what other players do. The game is

in the capable, if somewhat wacky, hands of Matthew Ward, who created both Micronet MUGs.

On *Trash* up to 64 players can take part, and I'm told by the people at Micronet that there's never a shortage of good players.

Trash is available all day and all of the night (that's enough *Kinks* quotes – ed) with the keyword *TRASH* and costs Micronet users 2p or 8p a minute, depending when you do your playing (includes network charges). Non-users can sample the game via Callstream on 0898 100 900 at the usual, and some might say extortionate, fee of 25p (off-peak) and 38p (peak) per minute.

By the way, can I just say that any one completely bemused by all this comms talk should be sure to secure a copy of the June issue of *ST Format*, which contains an excellent introduction to the subject. (No, there isn't time – ed)

BUDGET EXPANDS

I see that yet another software house has joined in the ever-growing ST budget war. This time it's Alternative who is planning an assault on the £4.99 front. To begin with most will be re-releases, with original games to follow.

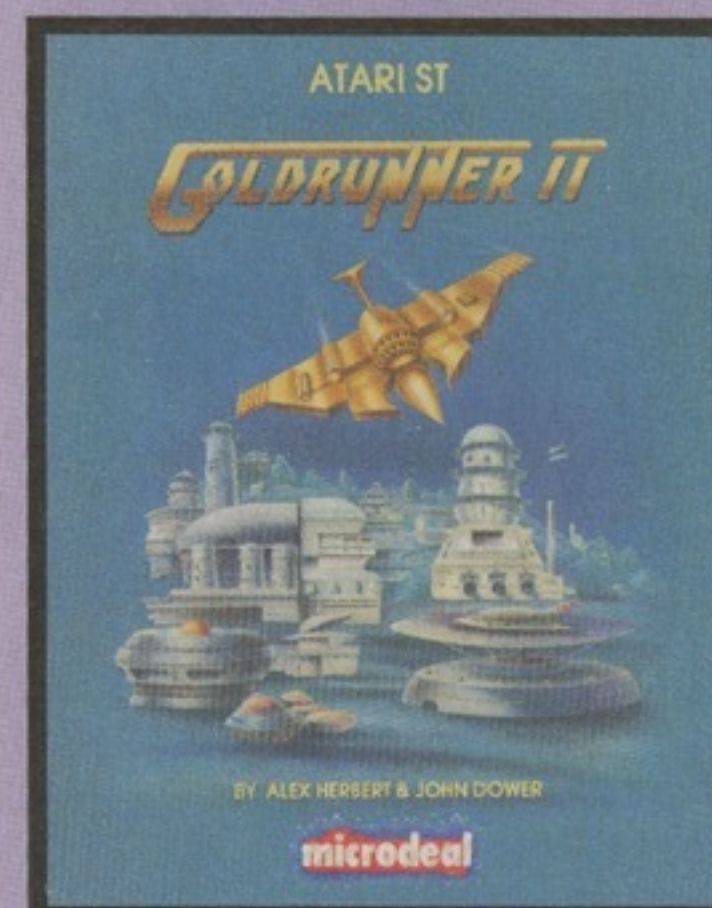
A MINUTE'S SILENCE

It's never very pleasant to have to report on the demise of an ST hardware and software. Even less so when that company is the Bath Computer Shack.

Let us all be silent for a moment as we mourn its sad departure. An auction

HOW MUCH?

And over to the budget 16-bit theme, Microdeal has packed in games production. So? you ask. So there's a brilliant opportunity to stock up on a whole series of classics and oldies – games like *Goldrunner I and II*, *Jupiter Probe*, *Karate Kid II*, *Airball*, *Leatherneck* and *Major Motion* – at the inviting price of just £3.99. Call for more on 0726 68020.



• Opportunity knocks – Goldrunner II and other Microdeal stock going for pennies.

was held at that veritable mecca of commerce Weston-super-Mare last week to dispose of office equipment once owned by said BCS.

Steve Carey

ST GAME OF THE WEEK

DRAGON'S BREATH

PALACE • £29.99

Adventures have a habit of setting you off on a journey to explore the weirdest of subjects. This latest one under the Palace label, the first since *Barbarian II*, is unlike any other RPG you've played.

The objective is to explore the mystical land of Anrea in a bid to collect and guard pieces of a talisman. How you go about this awesome feat is what makes *Dragon's Breath* special.

The idea is to build up an army of dragons and then send them out into the land to conquer villages and collect taxes. The game is always played by three people with any player not under human hands, controlled by the computer.

It's played from two main screens, each with a series of icons to enable you to perform major tasks. The key to the game is to build up an army of dragons because the more you control, the more havoc you can wreak in your game turn. Each turn represents

one month.

At the start you have one dragon so your first task is to put a another on to hatch. Dragons take several months to hatch, with the time period controlled by the heat that you put under an egg. To apply lots of heat, you need more money but if you run out of money in the middle of the process, the egg spoils and dies. Dragons cooked on a slower heat are much stronger but take longer to hatch.

To make money you send dragons out to conquer villages. If a village is controlled by another player, the stronger dragon often wins. The library books give you a clue to which villages are at war and by attacking one warring village, you receive cash from their opponents.

Within the game you can cast spells to make your

dragons stronger or to make money. Spells are a very complicated process and you need to refer to a special spell book included with the game. It takes some time to master the spell-making operation which involves buying the ingredients and mixing them in the correct fashion. Although you don't need to cast spells to win, computer-controlled opponents always use them, putting you at a disadvantage.

This is the most unusual and appealing adventure on the ST to date. Visuals and sound effects are exciting but it's the winning strategies which make it so much fun. Once you start dabbling in spells, you find the game becomes completely absorbing to the point that you have a hard job to stop playing.

Mark Higham

UK HOME COMPUTERS

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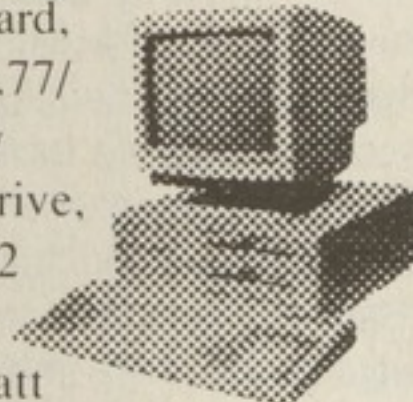
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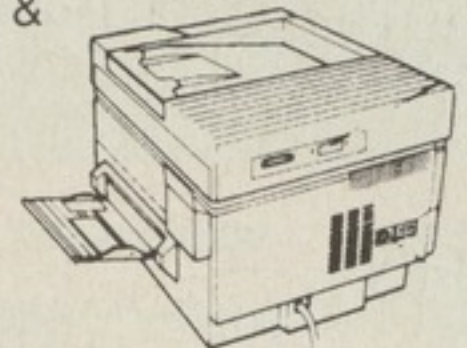
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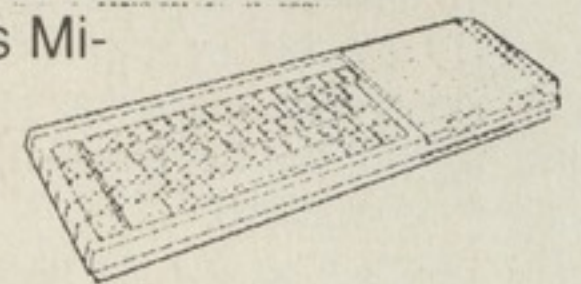
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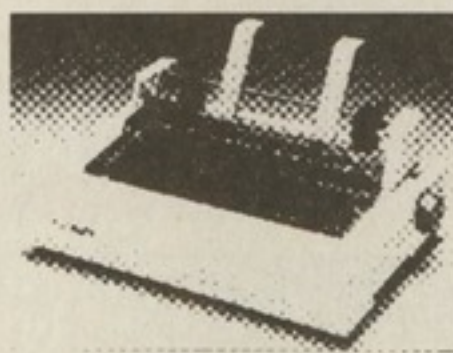


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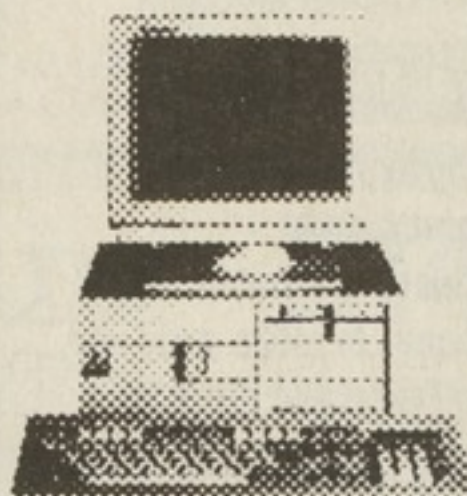
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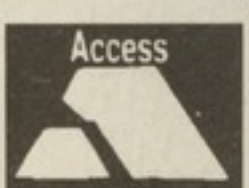
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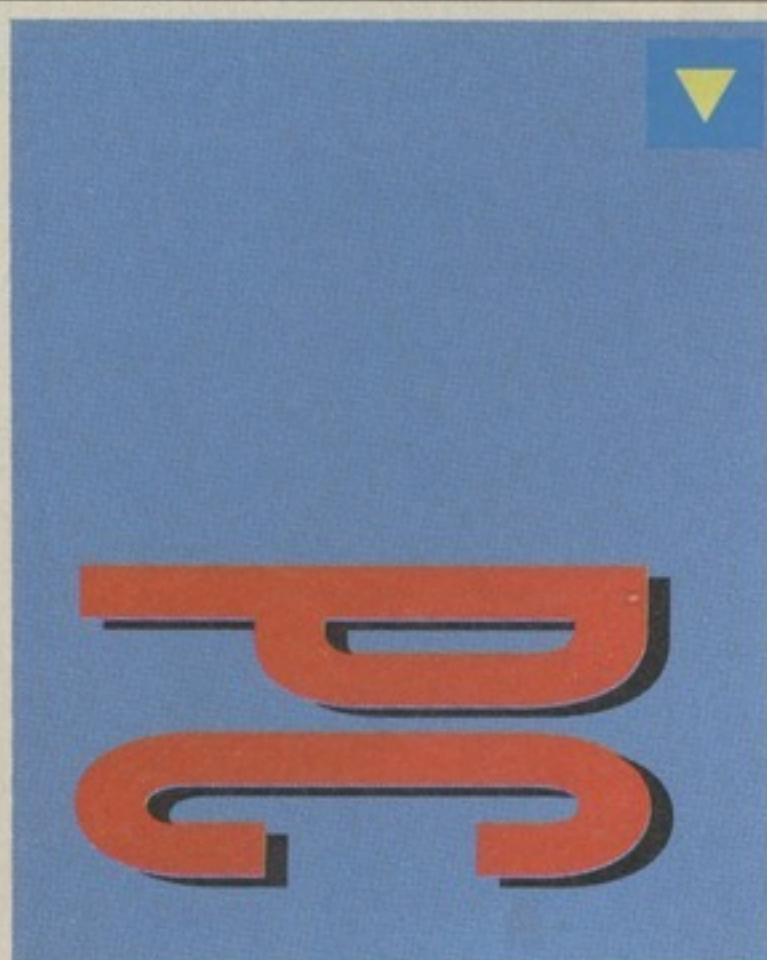


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CAD BOOT MANAGER

An idea I've put forward a couple of times in this column seems about to take a further step forward.

The Ctrl Alt Deli 0908 662759 will shortly have available a boot file manager, which enables you to compile and save CONFIG.SYS and AUTOEXEC.BAT files, so you can change the setup of your machine using it and the included warm and cold re-boot utilities.

The program is due out in a few weeks and should cost £34.50.

RM BIG BOYS

If you were asked which company had the distinction of being the biggest UK microcomputer manufacturing outfit, what would you say off the top of your head? Amstrad? Apricot? Acorn?

In fact the UK's biggest independent micro maker's name begins with an R, or so says Research Machines.

Following Apricot's sale of its manufacturing division to Mitsubishi for £39 million, Research Machines – which last year shipped 45,000 units – is left out on its own. It claims 6.4 per cent of the UK market to the end of 1990, with a turnover of over £53 million.

Many of the company's machines go

into education, where RM has the second biggest slice of the micro cake, after Acorn. The press release from RM that let me know all this, goes on in PR-speak: "The company attributes its continuing success to a rigorous quality improvement methodology [it's machines get better and better], focus on carefully selected market sectors [it sells a lot to education], and strong engineering and project management skills learned from detailed study of German, Japanese and US practice [is anyone out there interested in us?]."

LASERJET OUT OF VIEW

Spending most of my time writing about DTP, I decided to upgrade my LaserJet II laser printer to the new LaserJet III. This has been a great success. The new machine does everything the earlier model did, has more available memory in its base configuration (around 700K), and resolution enhancement technology (RET) to improve the appearance of diagonals and curves.

One thing which isn't an improvement, though, is the LCD display on the front panel. The new machine is much squarer in design, perhaps more LaserWriter-ish, and the LCD is now mounted nearer to the vertical, rather than at the sloping angle of the LaserJet II's control panel.

This angular feature makes the display somewhat more difficult to read, unless you're at just the right angle. It's a pity HP couldn't have run to a back-light for the panel.

I/O - LITTLE CROP STUNS ME

The anagram competition (Express 72) was a dramatic success, thanks to both the competitors. Mind you, Alan Edwards submitted 35 entries, all based on another Lotus product, Agenda, so in the end he was the only person on the short-list of five anagrams.

Lada GT no use had a certain ring to it – do know you why Ladas have

heated rear windows – to keep your hands warm in winter.

STE guano, lad may well be true, but we don't want to start any more MOBY letters, do we?

To a dung sale has a certain surreal panache, Salute Gonad plays proper attention to my rejoinder on taste and Slated guano is presumably the playing surface for the first Galapagos International Snooker Tournament to be held, no doubt, later this year.

By a short head, though, and Alan's head must be fairly short having ejected that lot, he gets the prize for A nut sold EGA, which is suitably insulting to both dealer and punter alike, depending on which way you read it.

And the prize? A copy of Mindscape's Harley-Davidson: the Road to Sturgis will be speeding its way to Alan Edwards of Leeds.

WHOOOPS, A PROPER LAPSE

Hands up all those who have been phoning GST's fax line after reading this column a couple of weeks back. The real GST sales number is 0480 496660.

This state of affairs serves me right for taking the mick out of JWP, GST's PR company! Sorry all.

FLIGHT SIM SUPERCHIP

Rumour has it that a new graphics card is under development in this country, making use of a very hush-hush Intel graphics chip.

A source within the industry says the new board will initially be used for coin-op arcade machines but there are already versions working as expansion cards inside PCs.

The new board will allow direct combination of video images from CD in real

time, so smoothly that you could, for instance, fly a plane around with the landscape being generated 'directly' under your wings, and all so fast you'll never see the join.

Other applications for this new technology include the ubiquitous graphics workstation as well as multimedia, the superimposition of several video sources into windows on the same computer screen.

ARTLINE

Digital Research caused quite a stir when it released the graphics package Artline 18 months back. A lot more stir was caused by Corel Draw and Adobe Illustrator later the same year, though, and Artline is perhaps not as 'cutting edge' as it once was.

Things are set to change later this year, or so DR hopes. By June it expects to have a new version of Artline available, packed full of extra features like the much-sought-after autotracing of bitmaps and the always useful fitting text to curves.

Included within the program will be a version of GEM 4, the long-awaited new GEM. In fact I am told that GEM 4 will be incorporated into Artline in the same way Ventura Publisher used a version of GEM 3. This means that the Artline can be run under Windows, like its main competitors. Like them, it won't be cheap – it comes in at £569.25.

Talking of Windows, a friend of a friend in the US has been running Windows 3 and he says that it is good, but it's slow and it's not like using a Mac. I'm not worried about the Mac part, but when are we going to stop having to throw processor power at software to get it to run at convenient speeds?

Simon Williams

A SLICE OF THE ACTION

Volkswriter, supplier of one of the earliest PC word processors, has just released a memory-resident product called Slice, which should be ideal if you need to refer to spreadsheet data or dBase files in the course of your work.

It acts as a clipboard between programs, and if so you desire you can lift sections of a spreadsheet or records from a database and deposit them straight into your waiting word processed document.

The program can read Lotus 1-2-3, Word and Figures, Symphony and dBase files, can display the data on screen for you to select and can then transfer it to a wide variety of word processors, including WordPerfect and WordStar as well, of course, as Volkswriter. In addition, Slice can be used to transfer data between spreadsheet and database, and can trim and re-arrange data items as it transfers.

The program only takes up around 60K plus the length of the data imported. It costs £86.25 and is available from Volkswriter on 0494 772422.

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CURRENT LISTINGS						
ADDRESS	BDRMS	RECEPTION	HEAT	AGE	COST	ON MARKET
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46 Prospect Pl	5	2	Oil	22	98,000	28-Apr-89
698 Rice Ave	2	1	Oil	25	92,000	04-Oct-89
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455 Daniels Rd	1	1	Elec	16	47,500	01-Nov-89
Function Keys						
Display this Screen	F1	F2	Select the row at the cursor			
Specify selection criteria	F3	F4	Insert selection into document			
Not used	F5	F6	Select the field at the cursor			
Not used	F7	F8	Not used			
Exit from Slice	F9	F10	Display application screen			

Press the Function Key for action shown. Press any other key for menu.

• Slice makes those transfers of data as easy as pie.

PC
GAME
of the
WEEK

CASTLE MASTER

Incentive •
£29.99

In the days when solid 3D vector graphics were really quite something, games such as Driller and Dark Side created quite a name for the British company Incentive. Now they've become almost commonplace but Incentive continues to make good use of its Freescape graphic system. Castle Master is the latest in the line.

As with all Incentive titles you look out on a full 3D representation of your world and can explore around, underneath and behind all the objects you see. In Driller and Dark Side this was the surface of a strange moon, but in Castle Master it is a 16th century castle.

Despite the setting, gameplay has changed



surprisingly little over the intervening years. Once again you are presented with puzzles to solve: doors that won't open until you activate the right button; bottomless pits that can only be crossed when the right item is toppled across their depths.

With Castle Master Incentive has moved closer to the old action adventure format, so there are doors that can only be opened when you find the right key, and clues written on the passage walls. You have a limited amount of strength, supplemented by wedges of cheese to be found scattered about the place

and sapped by spirits that can be defeated by bombardment with rocks.

Get it right and you rescue the princess – or prince if you've elected to play it that way – from the evil Magister.

Incentive describes the game as 'the first action adventure to use 3D solid polygons', and indeed underneath it is very like 3D Atic Atac. But then that was a very good game in its day.

CGA owners should also note that Freescape worlds will look almost as good as they do on an EGA display.

Matt Nicholson

520ST-FM SUPER PACK



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SPECTRUM

THE WORLD CUP

With the World Cup fast approaching it's probably not by spooky coincidence or a strange quirk of fate that loads of software houses have got heaps of Speccy football games all due for release as near as possible to the epicentre of Kevin Keeganesque hairstyles, xenophobic feelings and excessive alcohol intake that we all know and recognize as the event worth waiting for.

Here's a quick rundown of exactly what footy-related efforts you'll be able to play on your Speccy instead of watching England take a resounding thrashing at the hands of the The People's Republic of Nuristan/Greenland etc - B team.

For starters, Virgin has really pulled out all the stops, gone to town and come back with the officially-licensed World Cup game. The company also no doubt returns with a huge bag of TMs to plaster all over the box and instructions as well.

As you know from the review of non-Speccy versions in *Express 76 Italia '90* uses an overhead perspective for most of the match with a nifty switch to a goal-mouth view when you are in striking range. The Speccy version should be out very soon.

Addictive is planning a shameless cash in World Cup 1990 Edition of the best selling *Football Manager* which will apparently stay faithful to the original but feature lots of radical improvements. And if that wasn't enough there's a free wall chart with each copy.

US Gold is desperately hoping everyone forgets the last World Cup outing *World Cup Carnival*, a game so bad 1,000s of copies were encased in concrete and buried in the Nevada desert for public safety reasons. US Gold's *Italy 1990* tie-in is a playing sim with the obligatory list of revolutionary features, and it comes complete with a free World Cup file-of-facts.

As well as the World Cup inspired games, there are hundreds of other footy games due for arrival in the near-

ish future including *Kick Off 2*, both Liverpool and Manchester United licensed products, another Kenny Dalglish effort - *Soccer Match* - and even a Subbuteo simulator, which will, of course, need to include a treading-on-player feature to be completely true to the original.

POSTMAN PAT

C Nicholas of Hull has just bagged this week's quota of eternal gratitude by supplying me with the following cheats. Thanks C!

P47 - for infinite lives get a high score and sign your name as ZEBEDEE.

Strider - hold down Z and O on the title screen until the border flashes. The when playing the game itself, press H to pause and then Shift and 2 together will skip the current level.

ANOTHER ENIGMA

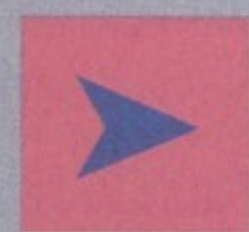
The latest issue of the magnetic magazine *Enigma* has just hit the streets, so watch out for sharp pieces of broken cassette tapes throughout the country. It's now been in existence for a whole year, and it deserves a hearty pat on the back for keeping the standard of each bi-monthly issue very high.

The latest edition (number six) is no exception and is sure to delight purchasers with its mixture of news, hacks, reviews and specialist adventure and technical columns. It's definitely got the edge over lots of traditional paper mags with lots of special effects that perform before your very eyes.

Enigma will load on every breed of Speccy known to man (including the Coupé) and it comes on tape with options to transfer to Plus D, Plus 3, Disciple, etc. Order your copy from 15 Westfield Road, Inverurie, Aberdeenshire AB5 9YR. Cheques should be made out to ESD.

Anything remotely Speccy related is gratefully received by me, Robin Alway at *New Computer Express*, 30 Monmouth Street, Bath, Avon, BA1 2AP.

Robin Alway



SAM COUPÉ

HIGH HOPES

Precious little Coupé-specific software has surfaced as of yet but already there's quite a selection of hardware thingumajigs, to use the technical term, which can be plugged in to one of SAM's numerous ports.

Something all tape-based Coupés would want their owners to buy is a disk drive. The SAM drives are slim-line high-tech looking models which slot under the machine as everyone knows.

They're excellent drives, come complete with the Disk Operating System and are available from MGT. Lastly, good old MGT has knocked together a Communications Interface which comprises a serial RS-232 port and a Centronics printer port for the all-in price of £29.95. Send an SAE for more details to MGT, Lakeside, Phoenix Way, Swansea, SA7 9EH.

IF YOU HAVE YET TO HEAR

Here is this week's plug for the latest issue of *Your Sinclair*, which has a not insubstantial amount of Coupé-related stuff inside its rather spiffing oriental-design cover.

As well as the first SAM Surgeon Page (which will surely pick up a Pulitzer prize for the picture of Emyln Hughes alone) there's Program Pitstop, that features an impressive Coupé graphics listing, an invaluable and rather sneaky way to getting as many Speccy games as possible working on your Coupé.

And at only £1.70, *Your Sinclair*, also published by those fine people at Future Publishing, has got to be the biggest bargain in the computer world since, er, the last issue. Check it out - right away!

Robin Alway



PCW

LOCOSCRIPT PC

LocoScript has made it out on the PC format. It was on sale at the *Which PC* Show and can be had from Locomotive on 0306 740606 for £125.

In case you've been stuck in an NHS queue for the last two years and don't know about it, it looks and works exactly as *LocoScript 2*, but on a PC (and it includes *LocoMail* and *LocoFile*, too).

With this package, you can transfer files between the PCW and PC with special software that Locomotive provides, and hence work on your Amstrad portable PC, for example, and tidy up those files on your PCW at home.

COME CLEAN

Jenny Barnes of Newcastle wonders if I practise what I preach. "Do you actually use a PCW to write the column and handle your correspondence, and if so, which software do you use?" she asks.

Yes, I use my PCW 8512 daily, Jenny, despite having access to an Apple Mac and various PCs. Furthermore, I use *LocoScript 2* (£25 from Locomotive, 0306 740606) for most of my correspondence because it can handle complex layouts and produce a variety of nice looking typefaces; *Protext* (£50, Arnor 0733 68909) for doing this column and various other writing jobs because it's fast and versatile; and *The Composer's Pen* for music manuscripts (£75 from Composit, 0952 595436).

TAXING [RETURN]S

A reminder to anyone who earns any money from freelance writing - you can claim some of the cost of your PCW against tax.

Basically, you can claim 25 per cent of the cost price against tax if you bought it in the last tax year; 25 per cent x 75 per cent, or three-sixteenths, of the price the next year; 25 per cent x 75 per cent x 75 per cent the next; and so on.

All this assumes that there is no 'duality of purpose' or else you can claim nothing at all, ie that you use it exclusively for your freelance work and not for playing games, writing letters to your friends, working out household accounts, keeping databases of your club members or record collection... good heavens of course not. I mean, the PCW is a dedicated word processor, isn't it?

HOT POTATO

Racked off by the price of printer stands? A cheap vegetable rack such as the ones from Argos for £9 work just as well, giving you a place to put all your paper, claims Jerome Perkins of London.

Put a piece of chipboard on top for the printer and cut a slot to feed the continuous paper through. The only trouble is, I suppose, that the potatoes get in the way of the tractor feed.

SCRABBLING AROUND

Tried to use *Scrabble* with *Flipper* and had no success because [SHIFT] [EXTRA] [EXIT] has no effect?

Select 'printout' from the menu; this re-enables the interrupts and [SHIFT] [EXTRA] [EXIT] now works. Well, most of the time.

Rob Ainsley



MSX

THE JOY OF JOYSTICKS

I have recently acquired two joysticks from Bondwell UK, the new distributor of the QuickShot range of games controllers, and I have been giving them a fair bashing on my trusty MSX.

Both 'sticks' are MSX selectable, so by using the MSX setting, you are able to use the fire buttons independently. Let's look at the cheaper joystick this week and next week I will give you my impressions on the wireless game controller, the Qs 12.

The device I wish to introduce you to this week is called the QS130F, and is your bog-standard twin fire button joystick with auto fire option and a switch on the underside of the base with which you select the setting to suit your computer or console.

The new range of QuickShot joysticks are certainly better made than the early QuickShots of a few years ago. The base is slightly contoured, allowing it to be hand-held, although you are also able to stick it to any flat surface (on my desk - no chance), via the four rubber suction feet.

The hand grip of the QS 103F sports two fire buttons, finger and thumb operated, and is also the position of the auto-fire switch which is just below the thumb operated button.

The grip is chunky and well shaped for the hand. Although the switches used on this joystick do not appear to be micro-switches, response has not suffered in any way, directional control is very good.

I do miss the click on the fire buttons though, the buttons on this stick being totally silent in use. This latter quibble is, of course, down to personal preference, so you may like this silent operation feature.

When you consider that it comes with a 12 month warranty, costs around £11.00, and is as good as many joysticks at a far higher price, I can only say it's a real bargain.

SOFTER STILL

Always on the search for good pro software for the MSX1 computer, it is good to see that items such as *Computer-mates' MSX CALC* spreadsheet and *MSX TEXT* wordpro and cards are still readily available, albeit at a high price.

Tavistock Hi-Fi of Bedford has informed me that these two items are available from them, on ROM cartridge at £49.95 each. Now this may seem a lot of money but, believe me, *Computer-mates'* products are good and, for the MSX1 computer, you won't find better.

In fact *Computer-mates'* had a hand in writing the excellent *Home Office 2* software for the Philips MSX2, which is good enough for me.

At the moment there isn't much choice regarding word processing for the MSX1, as the excellent *Tasword* has now been discontinued, although an MSX2 version is available in Holland.

Tavistock Hi-Fi can be contacted on 0234 56323. For those of you who can't afford £49.95 keep reading this column because I have just received a letter in which there are some items of software at very low prices.

Keith Neal



CPC

DISK DILEMMA

After all the speculation and hoohah over the new CPCs in the autumn, CPC owners are bound to be getting a little agitated wondering what's in store. One such agitated owner is Andrew Scott, of Ely, Cambridgeshire:

"After reviewing the situation concerning the new CPC that is going to reveal itself in the autumn, I have a number of questions.

"Firstly, is the new 6128 likely to have a 3.5-inch drive? Surely that now nearly all computers use either 5.25-inch or 3.5-inch it would be ridiculous to have this new range using the old 3-inch drives? After all, the main reason for Amstrad using the 3-inch was because of the surplus of diskettes it purchased cheaply from Hitachi. Right?

"So, if we assume that 3.5-inch will be incorporated, how will present 6128/664 users manage to copy all their software (as it is said that it will all be compatible) on to 3.5-inch without purchasing a 3-inch drive? Even if they have a 3-inch drive, how will they copy games and other protected software, without spending lots of money on fancy Multifaces and back-up programs?

"Secondly, if we present 6128 users need to sell our present computers to upgrade to the new one, and this uses 3.5-inch, then what are our friends to whom we sold the present CPC to do? All the games software etc will be on 3.5-inch.

"I can't believe all software will be available on 3.5-inch and 3-inch, as with 5.25-inch and 3.5-inch with the IBM-compatibles at present, as this even now causes chaos for many of the shop owners, and for people who want a piece of software on 5.25-inch which is only available on 3.5-inch..."

Hold on there a minute, Andrew, let's not get carried away. For a start, why assume that Amstrad is going to ditch the 3-inch format? It's not just the CPC range that uses it but the Speccy Plus 3 and the entire PCW range too.

While the story did go round that Amstrad only went for the 3-inch format because of the Hitachi business, I'm sure the firm had other reasons besides that. More to the point, having gone the way of the 3-inch disk, Amstrad is now thoroughly committed to it in my opinion, regardless of the reasons why the initial decision was taken.

No, I think any fears about disk sizes are groundless. I think possibly the major problem facing existing users is going to be how brilliant the new software is compared to the old stuff.

All those concerned are still keeping their lips firmly sealed on precise technical details, but we keep hearing from leading software houses that have seen the machine and come away mightily impressed.

DOOMED!

We haven't heard much from adventure specialist Topologika recently, which is why it was especially nice when a press release announcing its latest outing appeared on my desk.

Called *Last Days of Doom*, it's actually the third and final part of a trilogy written by Peter Kilworth. It follows

on from *Countdown* and *Return to Doom*, and includes the now-familiar and robotic canine companion.

You must solve a range of puzzles in order to save the planet of Doom from, er... doom, and on your way you'll meet such tricky items as squashed spaceships, renegade robots and the wretched 'slow beings'.

The game is certainly big enough, with over 150K of text and 218 'rooms'. The traditional Topologika on-line help facility will enable you to solve those puzzles too tricky to negotiate by giving you more and more hints until you discover the answer.

As with other Topologika adventures, *Last Days of Doom* is text-only. Cost is a rather nasty £19.95, but you do get a free game called *Hezarin* on the B-side.

You can order direct from Topologika at PO Box 39, Stilton, Peterborough PE7 3RL. Don't forget to add 50p for postage and packing.

GHOSTLY GOINGS-ON

You're kidding! Not another blinking ninja game? Yup, 'fraid so. *Ninja Spirit* (£9.99 on tape, £14.99 on disk) from Activision is a conversion of the graphically excellent IREM coin-op.

The game is a variation on traditional themes. It's another scrolling (strolling) kick'em-up, but this time, your defeated enemies occasionally leave behind... wait for it... *Ninja Balls*.

You pick these grisly items up to get power-ups, and these include triple-firing shuriken and ghost ninjas. In turn these act like drones in shoot'em-ups, following you round.

Graphics on the CPC, needless to say, aren't quite in the same league as that of the arcade machine. The sprites are very good, but on the lower levels the backgrounds are messy and confused. Later on, though, things clear up a bit and the game starts looking quite good. Best feature of all are the colossal end-of-level guardians.

Even the guardians won't hold you back for long, though. Practiced jump 'n' kickers will find themselves progressing through the game just a bit too easily. It's not really a shortage of enemies, more the incredible, heaped-up firepower at your disposal.

DRAGON SPIRIT POKE

Pokester Graham Smith has turned up another handy routine, this time for those of you seeking eternal life for *Dragon Spirit*.

```
1 ' Dragon Spirit -tape-
2 ' By Graham Smith
3 ' Infinite lives
4 ' Method 1
5 '
10 DATA 06,00,11,00,80,cd
20 DATA 77,bc,21,11,be,22
30 DATA 73,80,c3,00,80,af
40 DATA 32,6b,20,c3,1d,00
50 FOR j=0 TO 23:READ a$
60 x=VAL("&"a$):y=y+x
70 POKE j+48640,x:NEXT j
80 IF y<2091 GOTO 100
90 CALL 48640
100 PRINT"data error"
```

Rod Lawton



C64

PERILOUS PROGRAMS

It has probably happened to all of us at some point or other. A precious program has been typed in and, rather foolishly, we run it rather than saving it to tape or disk beforehand.

The 64 locks up, sulks, and refuses to talk. Hours of typing wasted; or is it?

If you've got a cartridge you can reset the machine, or if you haven't you can take the risky step of straightening a paper clip and attempting to reset the computer via the disk drive port (I'll let you judge the risk - only do this if you know how to do it safely).

Then, after at least getting the 64 in communicative mood, you can POKE 2049,9 and POKE 2048,XX, where XX is a number depending on the length of the first line of your program.

Just keep trying and LISTing until you get a sensible looking program, save immediately, turn the 64 off and on again, LOAD program, and pray for the results you want!

YOUR CHEATIN' CODES

As I gather these cheats from around the world, I can only praise the people responsible for finding them all out in the first place.

How, you may wonder, did anyone discover that on *Cybernoid* you can redefine the keys to YEXS and thus enter cheat mode?

From there it is but a small step to *Cybernoid II*, where you redefine the YGRO for a similar effect.

On *Bounder*, if you hold down IQAZ and the space bar for 30 seconds the border will turn grey and a-cheating we will go.

On *Future Knight*, hold down BUG87 to enter cheat mode.

Finally, you can gain immortality on *Ace II* by typing DUSTYBAG on the first title screen.

More of these - notably for *Crystal Unicorn* - next week.

DEATH BY MIS-ADVENTURE

If there's one thing that might have hastened what appears to be the demise of the text adventure, it is the construction of what, to me, seems to be totally illogical solutions to problems.

Take, for example, *Himalayan Odyssey*. Nothing wrong with having a little maze in the blizzard (N, N, W, W, W if you're struggling) but why, in Heaven's name, do you have to wear a yeti tooth to enter a monastery?

In *Gruds In Space* (love the title) we merely get a repeat of an old and favourite problem, the GIVE something TO somebody routine.

If you give a coin to a butler he'll let you enter Lord Deebo's, but can't people come up with anything original? And who expects to find a gun under a swamp? Let's hope the newer breed of games don't end up going the same way.

AND FINALLY

I have yet to receive my latest copy of *Commodore Computing International*, and this odd state of affairs set me to thinking. Then, after reviewing my notes, I discovered scribbled on a yellowing margin that CCI has gone bi-monthly!

Peter Gerrard

YOUR FORMAT

AMIGA	10
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PCW	16
MSX	16
CPC	17
C64	17
Atari XE	18
QL	18
Archimedes	18
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QL GAMES

Most QL users don't seem all that interested in playing games, but for those of you who like that sort of thing, there are quite a few around. They cover the usual range from shoot-'em-ups to chess.

The supplier with the best selection appears to be TK Computerware with around 40 titles. TK is at Stone Street, North Stanford, Ashford, Kent TN25 6DF. Or as an alternative, you can phone 0303 812801.

Judging by the adverts in *Express*, there appears to be quite a demand for programmers with 68000 experience. In my opinion the QL, with its bit-mapped display is the ideal machine on which to learn such skills.

Indeed, if you find you have an aptitude for this type of programming you shouldn't have too many problems with the ST and Amiga.

A good starting point would be to write your own graphics routines in assembly language, and use them to develop a simple game. If you write directly to the screen memory, your program should transfer quite easily to the other machines.

MERZ BUYS ABC

I heard recently that hardware supplier ABC Elektronik has been acquired by Jochen Merz Software. Both are based in West Germany.

ABC has developed several interesting products (such as a hard disk interface), but has always been dogged by production problems.

Merz's main hardware product is the QL emulator for the Atari ST and he is now selling Mega STs with the emulator fitted.

A modified UK Mega1 ST costs a total of £749, including insured carriage. You'll have to pay duty and VAT on top of this, of course, which makes it rather expensive, when compared with the UK price of about £450 for the basic Mega1. The emulator kit sells for £170.

Jochen Merz Software is at Im Stillen Winkel 12, 4100 Duisberg 11, West Germany.

TEBBY TO LEAVE QL SCENE

Tony Tebby, of QJump, recently told me that he is winding down his QL activities, and will be devoting his time to non-QL hardware and software consultancy, based in France.

Tony, formerly with Sinclair Research, was largely responsible for the design of the QL, and wrote QDOS, the QL's multi-tasking operating system.

Tony's commitment to the QL has been a major factor in the machine's survival. He is well-known for being incredibly helpful to users with difficulties. In many cases he has sorted out problems that have been nothing to do with QJump's own products.

Do not despair, however, Care Electronics hopes to be able to continue to supply QJump's products, including the new QPac II package.

John Torofex



SHOWING OFF

As I write this column it is the day before the *Which Computer?* Show over at the NEC in Birmingham. Owing, however, to magazine deadlines, by the time you read this any secrets kept for the show will be well and truly out of the bag.

I will stick my neck out and say that Acorn has little or nothing to amaze us this year. The company will do nothing concrete about the future of the Master 128, although speculation about its demise continues.

This is simply because the general trend at computer shows is to announce new products not kill off old ones, which is usually done in a much quieter way. The only initiatives from Acorn are going to be marketing led, with much drum-banging and recruitment of third-part VARs (value added resellers).

For those of you in the dark as to the function of VARs, they are people who take a number of components from different sources. They then sell the result to an unsuspecting punter as a solution at enormous profit.

SPEAKING OF MARKETING

Speaking of marketing, one of the biggest mysteries of recent times has been the total absence of effort made by the BBC with respect to software.

The BBC of course, was one of the biggest software houses of the Model

B's early days, but recently the company has faded from the limelight. The BBC's software is now handled by Longman-Logotron which, while being well-known in its own field, does not have the cachet of the BBC name.

I rang the BBC and managed to have a quick chat with Jenny Allen, who explained that current policy was to devolve the marketing function to those with suitable specialist knowledge.

She also said that the BBC was working in close partnership with Longman-Logotron and that new products were planned. This still seems surprising, given that the ITV companies have started marketing their own educational software to great success.

She also promised to find me a contact who could explain the situation in greater depth. I will look forward to that and will pass on whatever knowledge comes of this foray to the readers of this column.

UP TO TIP

This week's tip is more of a recommendation for a company called EMS, the good people from which can be found at 12 King Street Industrial Estate, Langtoft, Peterborough; alternatively, you may telephone 0778 36752.

EMS specialises in computer repairs and I have found the folks there to be honest, efficient and cheap. For example, I was charged only £5 for fixing a dry solder joint on my Master 128, even though I took it in twice. By way of reassurance, I have no personal connection whatsoever with EMS.

Andrew Brown



VISITATION

Last week, I talked about running a small club or user group using *Mailing List*, *Filing Manager* and one or two other serious software packages.

So, you've got the member's names and addresses under control, subs reminders automated and stored on disk, but what about the headaches involved when it's time to give an account of yourself at the end of the fiscal year?

Now there's *Visicalc*, an electronic spreadsheet designed to simplify the process of managing financial transactions and bookkeeping. What, you may ask, is a spreadsheet?

A spreadsheet is an electronic representation of a piece of graph paper. The computer display is divided into rows and columns creating a matrix of 'cells'. Each cell can contain a value, variable name or formula. And cells can be made to effect each other in order to calculate percentages, sums and so on.

The power of the spreadsheet lies in the ability to perform 'what if?' functions - adding or subtracting particular values in order to predict the outcome of possible transactions.

Skeleton spreadsheets can be stored on disk and the results printed out for safe storage.

Visicalc includes a manual so that even the most hardened technophobe can get to grips with the program's powerful features. Currently available from Silica Shop among others, *Visicalc* costs £39.95 and is a bargain at that price.

Edmund Blake



CUTESY GAME BUGS ARC

I've now received some of the Minerva games I wrote about a couple of weeks back. *Bug Hunter* is the main feature on the first of these, with *Moon Dash* the 'B' movie. Both games are written in BASIC and compiled with the ABC 2 compiler from DABS Press.

Bug Hunter pits a big-mouthed, twin-antennaed, sucker-footed reject from a genetics experiment against all kinds of creepy-crawlies. It's basically a platform game, but with enough innovation to keep it interesting.

Each series of four or eight screens represents an 'infested' house, where insects patrol the floors, surfaces and ceilings. In later levels they fill the air spaces, too.

As BH walks left or right he automatically climbs up vertical walls or under horizontal surfaces, looking for things to drop on unsuspecting bugs.

To squash a bug, BH has to grab some object from the room itself - a milk bottle, vase, flowerpot or whatever - and climb to a vantage point from where it can be dropped.

Spiders on the ceiling can be splatted with gas-filled balloons, but you have to avoid the falling corpse. Each level presents a new twist and gives plenty to think about. There's also some cute animation between levels.

Moon Dash is a variant of the old moon buggy game - jump the holes, shoot the boulders and falling nasties. It's OK, but has little lasting appeal. Nice scrolling landscape, though. Overall the

package is worth the £17.95 for *Bug Hunter* alone.

These games do not present the best graphics in the world, but they do offer decent, progressive gameplay. Contact the good people at Minerva on 0392 437756.

CAST 1 PEARL

Another product mentioned before and now arrived is *Cast 1*, an electronic cash book from Soft Rock Software. This is the first of a series of projected accounting applications and takes over the machine, rather than simply working on the desktop.

The program handles up to 10 separate accounts under a series of different analysis codes, and it gives space for invoice details, description and cheque number on each item paid in or out. The program is intended for the individual or small business and can cope with VAT, though for some reason you're obliged to enter the VAT components of transactions yourself. It would be better to enter global VAT rate codes and have the program work the amounts out.

Cast 1 can produce a good selection of reports and there are plenty of instructions for setting up Epson-style printer codes.

The manual is generally well written, and clearly explains the working of the program. Rather more general description of the manual's structure would be valuable, though.

Someone desperate for a book-keeping aid may wonder why he has to

go through and set up printer codes before entering any transactions. The manual is paper-bound and would perhaps be better in a spiral binding. The review copy started losing pages before the review was over.

VAT codes aside, the program works well, and should ease the strain on anyone having to prepare quarterly VAT returns or end of year accounts.

The cost of *Cast 1* comes in at a reasonable £29.95 and Vince Hudd of Soft Rock is available on 0272 503639 most evenings.

TINTS AND HIPS

Several good people have written in with details of how to grab a desktop screen. The most effective of these is from Allan Dean, whose method I would like to pass on now.

Set up the desktop screen you want to capture and open the task manager. Click Menu and select New Task. Enter SCREENSAVE ScrSave and a !Paint file containing a picture of the screen is saved to disk.

This technique is an improvement on the Get Screen Area option within !Paint itself, as no extra menu is added to the captured screen. Thanks very much for your help, Allan.

I don't want to seem churlish, but I was really after a screen grabber that would capture screens from programs which didn't use the desktop, such as (whispers under breath) games. Any offers, anyone?

Bertrum Carrot

THE ATARI ABC

Now, there's a PC-AT compatible that not only solves problems like other AT compatibles, it also solves the one problem that its predecessors have created ... affordability.

Silica Systems are pleased to present the new Atari ABC. The ABC is a 286 AT compatible that runs at over 5 times the performance of the IBM XT. This is achieved by combining the power and speed of a 16-bit 286 processor, with Atari Corp's development experience and engineering capabilities, which use the very latest in design technology. However, the Atari ABC's are available at 'XT prices' and many XT owners will wonder why they paid more, but got less!

The ABC is a reliable, high performance computer, built to exceptionally rigorous standards. It is well designed, to a state of the art specification, maintaining maximum expansion capability for the future. This includes up to 4Mb of RAM and 3 AT expansion slots. Plus, unusually for a PC at this price, the ABC has the ability to install two or three extra drives, with the cabling already inside the CPU.

The ABC has a host of impressive features, all built-in as standard, encouraging simple installation and ease of use. In addition, the ABC's small footprint and quiet operating, mean that you will notice it less on your desk than other PC's. Except, of course, when you begin to take advantage of its AT power.

At its remarkably low price point, the ABC is ideally suited for home, office and educational use and will take full advantage of the vast range of PC compatible software. And, with 12 months FREE on-site maintenance (8 hour response), you can rest assured that your ABC will be fully supported.

The ABC is the latest addition to a comprehensive range of both 286 (8Mhz or 12Mhz) and 386 (16Mhz and 20Mhz) PC's, from the Business Systems Division of Atari Corp. Atari's PC range offers an unsurpassed combination of reliability, compatibility and expandability, with unique features like Atari's 44Mb removable hard disk on their PC4. Return the coupon NOW for further details of the complete range of PC products from Atari's Business Systems Division.

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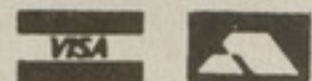
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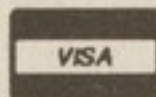
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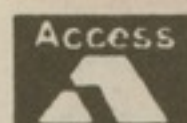
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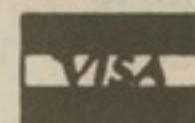
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● WORD WRITER

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0480 496789
£79.95

Excellent text handling on a fast WYSIWYG word processor with built-in spell checker, thesaurus, outliner and mail merger. Only problem is with layouts - more than one in a document and things get a little hairy!

- ▲ Lots of great features
- ▲ Useful outliner included

▼ Layouts restricted

● PROTEXT

Arnor
0733 68909
£99.95

Easily the fast ST word processor – not surprising since it dispenses entirely with GEM – and stands out as fast keyboard

driven text processor. Full of features it zips along at an unsurpassed rate

- ▲ Powerful macros, spell checker and mail merge
- ▲ Calculator, word count, memory editor

- ▼ Command driven
- ▼ No menus
- ▼ Restricted WYSIWYG

● THAT'S WRITE!

Cavendish
071-323 4761
£129

Another powerful non-GEM word processor featuring excellent layout control along with a font designer and screen grabber. Also includes useful functions such as auto indexing, contents generation and hyphen control

- ▲ Brilliant print-out results
- ▲ Powerful macro system

▼ No spell check or mail merge

● WORDUP

HB Marketing
0895 444433
£ 59.95

Almost qualifies as a DTP package as it includes graphic import, auto text flow around graphics and loads of different type sizes and styles. Excellent for producing stylish documents

- ▲ Good control over layout
- ▲ Quasi-DTP capabilities

▼ No spell checker

▼ Can only print its own fonts

SPREADSHEETS

● K-SPREAD 3

Kuma
07357 4335
£24.95

Good entry level spreadsheet which is fully compatible with other programs in the 'K' suite. A powerful Lotus-look-alike using GEM to provide a workspace of 256 columns by 8,192 rows. Many features such as text handling, arithmetic functions make it an excellent all-round business program

- ▲ Comprehensive low-cost package
- ▲ Lotus style capability
- ▲ Good manual

● DIGICALC

Digital International
0395 45059
£39.95

An easy to use spreadsheet which dispenses with GEM to provide a keystroke driven workspace full of popular facilities. 512 columns by 52 rows are supported plus the usual range of numeric functions

- ▲ Fast recalculation
- ▲ Holds full sheet entirely in memory
- ▲ User defined macros available

▼ No graphics
▼ No GEM
▼ No comparison functions

● VIP PROFESSIONAL VIP Technologies £149.95

A GEM version of VIP on the PC, supporting 8,192 x 256 cells and following the Lotus 1-2-3 industry standard. Fast editing and simple database functions complement a full range of features including keyboard macros

- ▲ Lotus controls
- ▲ Acts a simple database
- ▲ Graphic output

▼ Slow on large spreads

ACCOUNTING

● FINANCIAL CONTROLLER

Sagesoft
091-284 7077
£343.95

Comprehensive accounting package that includes all the features you're ever likely to want. Integrated sales, purchase and nominal ledgers, stock control and printed reports are supported as is auto invoicing.

- ▲ Fully comprehensive, powerful package
- ▲ Good manual

▼ Needs a hard disk

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Sagesoft
091-284 7077
£171.35

Fast, powerful accounts package that includes integrated sales, purchase and nominal ledgers. No stock control but auto invoicing is supported along with form printing and sales analysis

- ▲ Good features for the price
- ▲ Flexible with many features

DATABASES**● SUPERBASE PROFESSIONAL**

Precision
081-330 7166
£249.99

The ultimate ST relational database management package. Features videotape recorder style push-button controls to navigate a complex yet easy to use extravaganza which includes text processor, form editor and a built-in programming language boasting over 200 command words

- ▲ Easy to use and extremely powerful
- ▲ Infinite field size and number of records

● DATA MANAGER PROFESSIONAL

Timeworks
0954 80318
£ 69.95

A full-featured professional-grade data management tool which can be used with GEM's pull-down menus or directly from the keyboard. Relational operators allow powerful data searches among its maximum file length of 32,000 records and as this is RAM-based, DMP can sort at 100 records a second.

- ▲ Exceptionally easy to use
- ▲ Impressive report facilities
- ▼ Manual needs a better index

DESKTOP PUBLISHING**● TIMEWORKS DTP**

GST/Timeworks
0954 81991
£129

One of the first medium priced DTP packages, GEM based and compatible with the wide range of Bitstream Fontware. A frame based system incorporating master templates, paragraph styles, page guides and automatic text wrap-around graphics. Timeworks also includes a good range of drawing facilities and is able to handle documents up to 999 pages.

- ▲ Excellent DTP at budget price
- ▲ Imports wide range of text and pictures

● FLEET STREET EDITOR

Mirrorsoft
071-928 1454
£184

A GEM style package, Bitstream font compatible, but generally slower to use

than real GEM DTPs. Both text and Graphics can be manipulated on the same screen and overlap each other. A wide selection of clip art is supplied but the working document has to be reloaded before insertion.

- ▲ Good clip art selection
- ▲ Wide file format supported

- ▼ No automatic reflowing of text
- ▼ Relatively slow and unfriendly

● PUBLISHING PARTNER

Clik ST
0753 682 988
£ 159.99

Excellent GEM-based page make-up system, with multiple-on screen pages, impressive range of fonts and text sizes and facility to import different ST graphics formats. Also includes a range of drawing tools and variable magnification. Fast screen updates and high quality printer output

- ▲ Comprehensive and fast
- ▲ Excellent value

● SIGNUM 2

Signa
0252 874406
£184

Billed as a document processor, Signum allows text to be placed and adjusted to accuracies of up to 1/90th of an inch as well as imported graphics and technical fonts and symbols. Dot-matrix and laser printers are supported.

- ▲ Fast screen updates and response
- ▲ Compatible with Signa's scanners, digitisers and Mac emulators

- ▼ Price

GRAPHICS**● CYBER PAINT**

Electric Distribution
0480 496666
£69.95

Breathtaking bitmapped animation and graphics package from American Antic. This program features some incredible effects including tweening (changing one object to another a line at a time) and very powerful animation functions. Rivals the Amiga and is highly recommended.

- ▲ Very powerful animation
- ▲ Stunning effects
- ▲ Cheap

● DEGAS ELITE

Electronic Arts
0753 46546
£24.95

Like Digipaint for the Amiga, Degas Elite was one of the first painting programs for the Atari and it's still one of the best. You can have eight word screens at once, cut and paste between any of them and there are plenty of powerful functions such as zoom, block handling.

- ▲ 8 screens available
- ▲ Powerful block handling

- ▼ Lacking in features
- SPECTRUM 512
- Electric Distribution

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Painting package featuring (as its name suggests) 512 colours. The program is simple to use and effective. There's some very powerful functions too in the form of anti aliasing and gradient fill.

- ▲ Lots of colours
- ▲ Easy to use

▼ A little expensive

● ADVANCED ART STUDIO

Rainbird
0606 504326
£22.95

Aimed at those with a serious interest in producing quality art/graphics displays. the Advanced Art Studio. An enormous range of fills as well as comprehensive zoom and text handling complete this package.

- ▲ Lots of fills
- ▲ Powerful manipulation tools

MUSIC

● CREATOR
C-Lab (Sound Technology)
0462 480000
£285

Rapidly becoming the most widely used of sequencers it has excellent editing and arranging features. Although not cheap, if you are serious about music then this is the one to go for. It can be expanded with hardware to control up to 64 instruments independently

- ▲ Excellent facilities
- ▲ MIDI file compatibility
- ▲ Will also adapt to video sync
- ▲ Good editing

▼ Handbook can be hard to get to grips with
▼ Expensive if you are not serious

● TRACK 24
Comus/Soundbits
021-733 2063
£75

Well priced budget sequencer with more features than you would expect, rivaling software twice its price. Compatible with their more up-market sequencers and scoring packages.

- ▲ Cheap
- ▲ Good sequencing facilities including mixdown
- ▲ MIDI File

▼ Editing is peculiar

● STEINBERG PRO 24
Evenlode
099389 8484
£285

This has been the industry standard for many upon many years. The soon-to-be-available Amiga version should prove as interesting as the versions previously released on other machine specs. They are pushing their new program 'Cubase' at present, but one should not neglect this easy to use and very popular program. Make sure you get at least version 3 though.

- ▲ Easy to use
- ▲ Established program
- ▲ Easy editing

▼ Price

● VIRTUOSO
The Digital Muse/Audio Software
071-586 3445
£225

A new all British program having its first outing this year. Initial reactions are favourable and it has many things in its favour. It has all the features that are available on much more expensive packages and still remains quite easy and friendly to use.

- ▲ Very fast - thanks to re-writing of screen management
- ▲ Very accurate
- ▲ Can perform disk operations while still running
- ▲ Many excellent features

▼ New and therefore untested in the general market
▼ Price

● SUPER CONDUCTOR
Microdeal
0726 68020
£49.95

Very popular little sequencer that will also control the ST sound chip. Well thought out, especially in the song arrange section. Can also cope with the fine details of MIDI including systems exclusive editing.

- ▲ Suitable for beginner
- ▲ Easy arrange section
- ▲ Well documented
- ▲ Controls internal sound chip
- ▲ Good if you want to control MIDI via data

▼ Editing not too easy
▼ Quantize limited

● EZ TRACK PLUS
Syndromic Music
081-444 9126
£49.95

Reasonable sequencer that is fairly easy to use. Compatible with other Hybrid Arts programs that also boast a multi program environment. Limited on quantizing but not bad for the money. Editing in data only but good for organising songs.

- ▲ Good price
- ▲ Easy to use

▲ Compatible with Hybrid Arts EZ Score
▼ Limited on editing and quantizing

● REPLAY 4
Microdeal
0726 68020
£59.95

One of the first sampling packages now in its fourth version. Earlier versions available on public domain as sample players only. MIDI well looked after.

- ▲ Editing very easy
- ▲ Samples sound very clean
- ▲ Tried and tested program

▼ The ST is not the best sample player.
● MUSIC STUDIO V3
Activision

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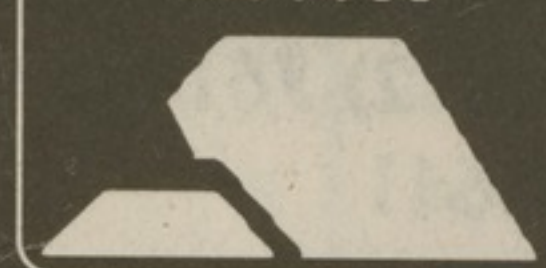
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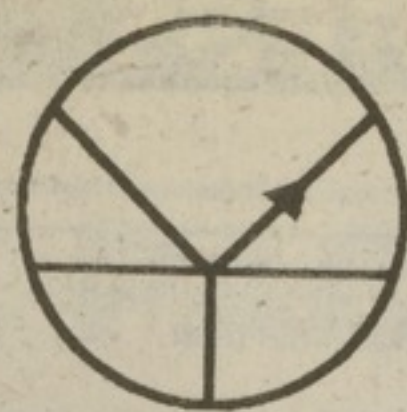
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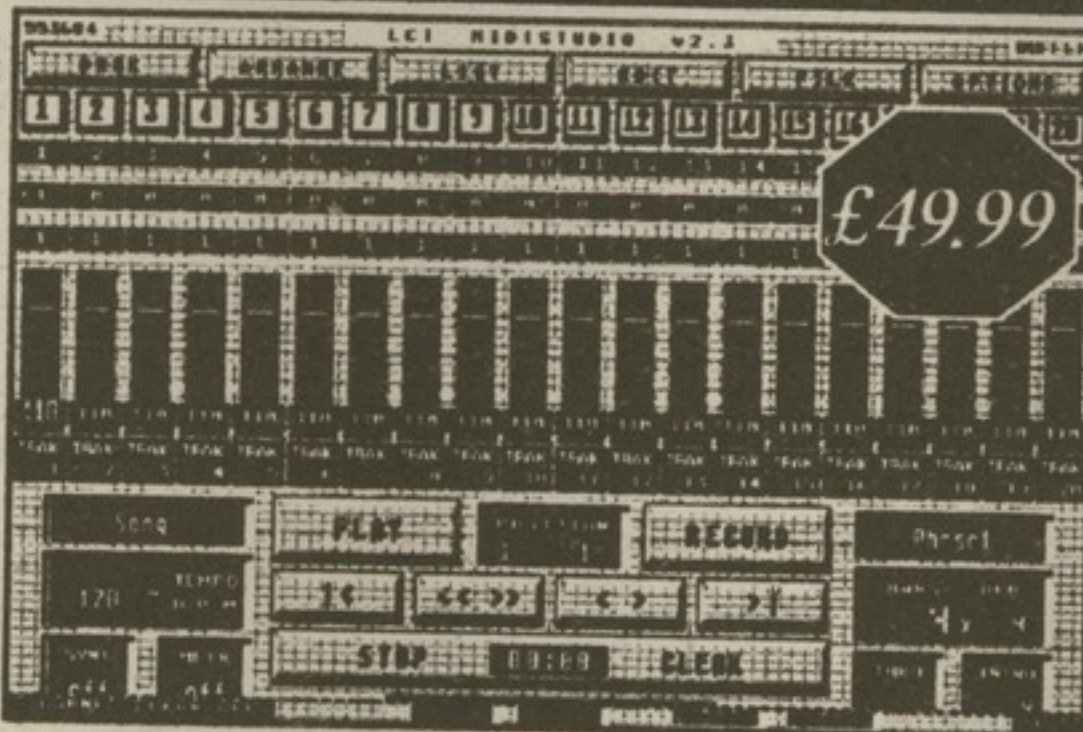
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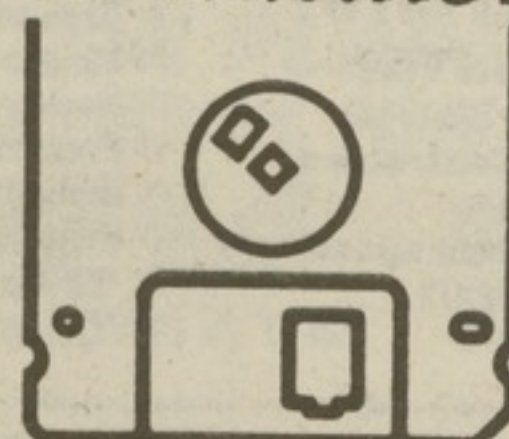
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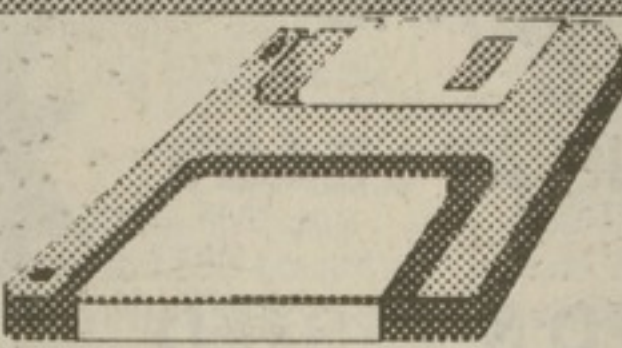
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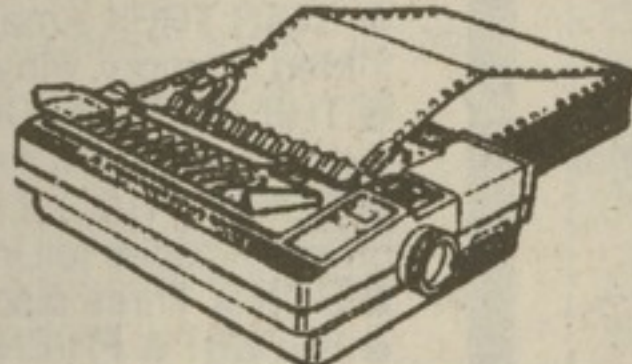
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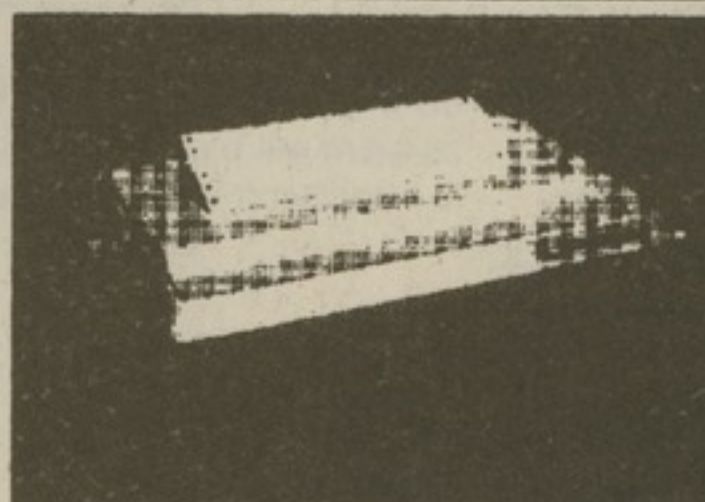


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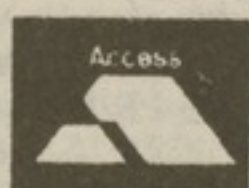
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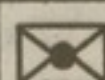
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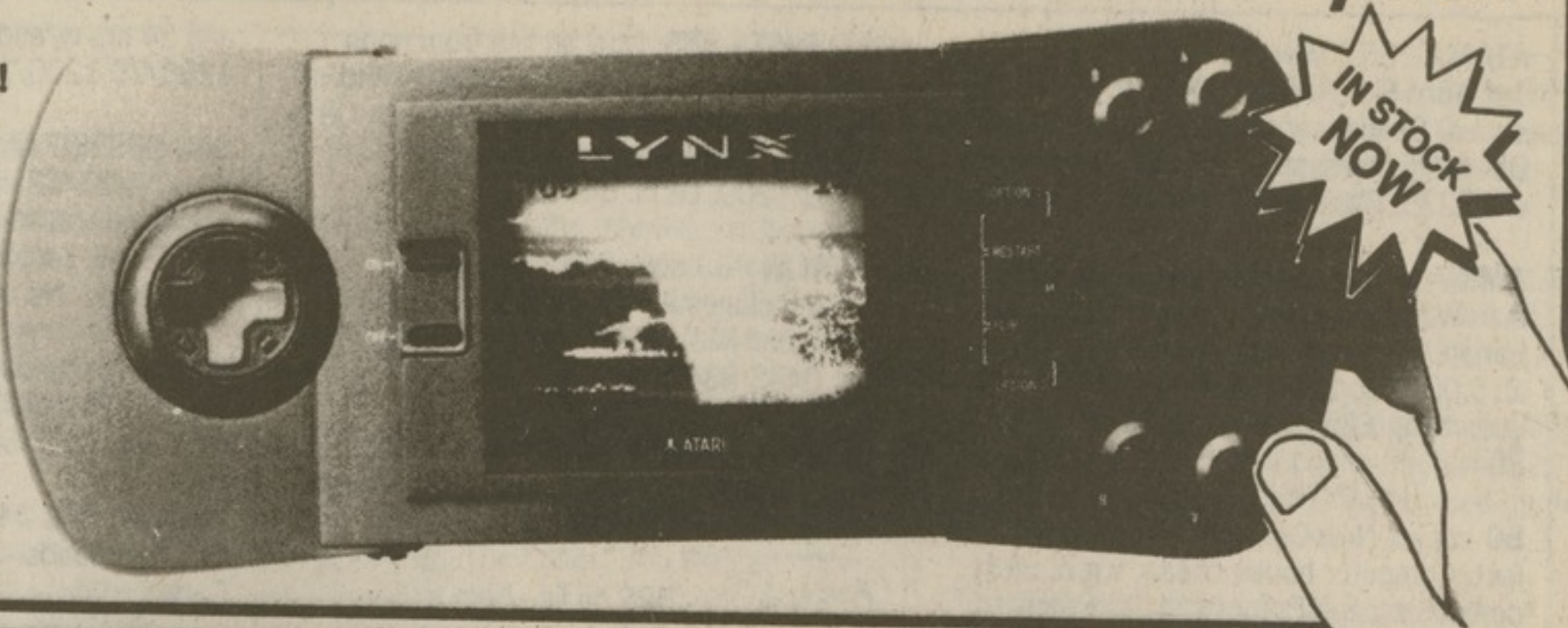
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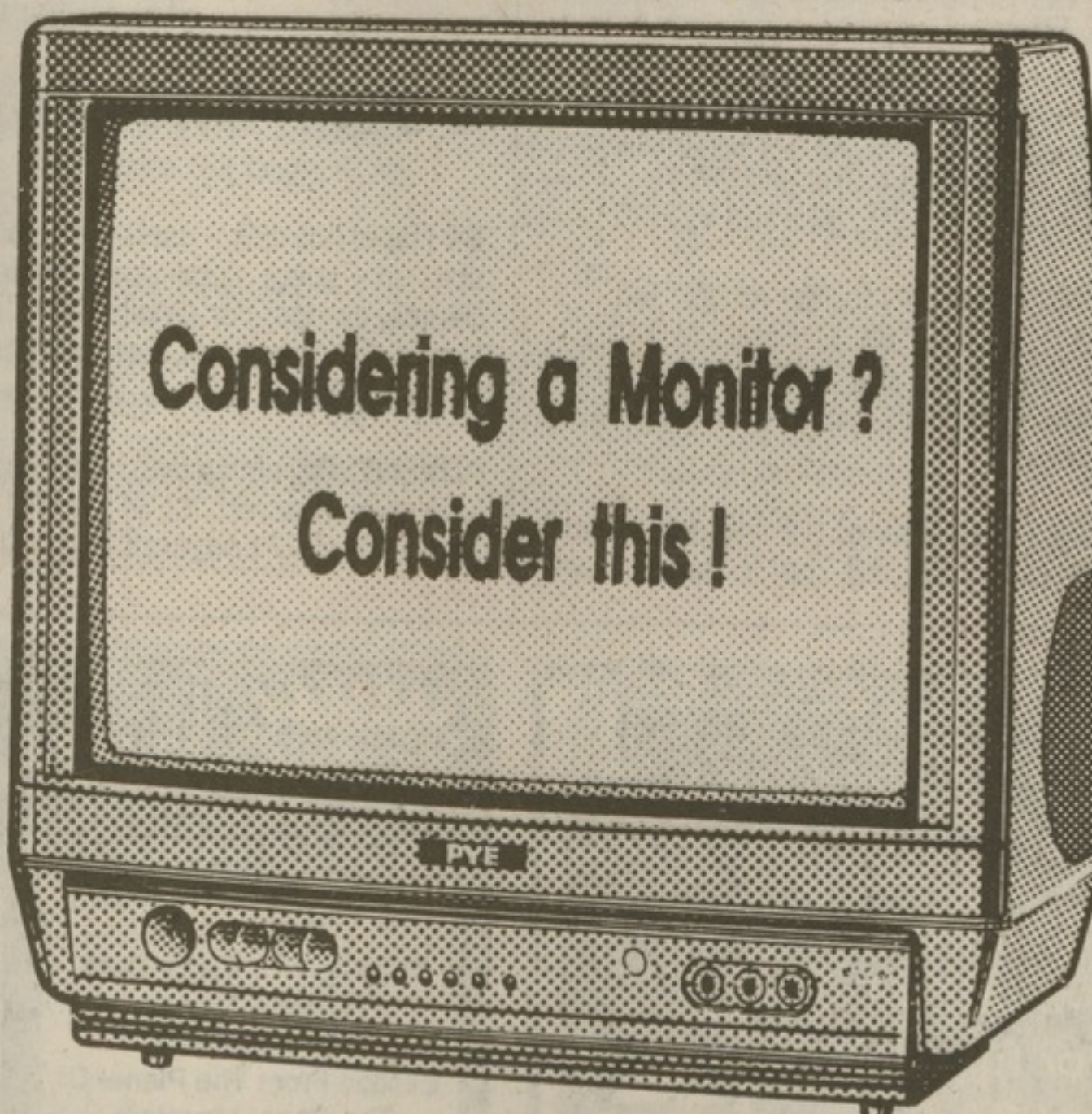
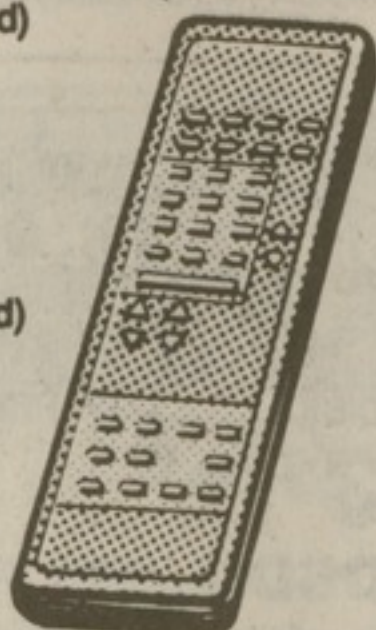
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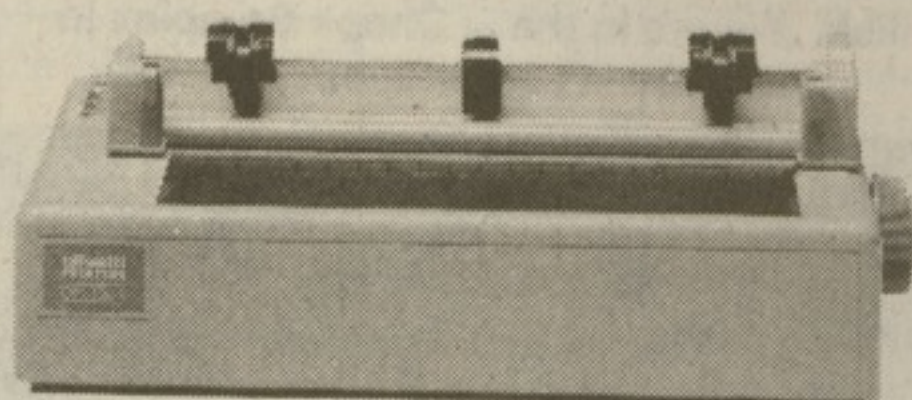
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BOURNEMOUTH and POOLE Atari User Group. Support for 8 Bit and ST. Monthly meetings. Membership £8.00. Quarterly Newsletter 8i16, £3.80 four issues. Details write to: 248 Wimborne Road, Oakdale, Poole, Dorset.

COMPUTER Student Contacts Wanted. Write to A. M. Drewett, 37 Longdon Ave, Aylesbury, Bucks HP21 9UW.

DISK magazine for Amiga freaks. Send Submission on disk to: Arthur Wyatt, 68 Shefford Road, Meppershall, Shefford, Beds. Submission disks get returned with magazine on, blanks returned as blanks.

DOES anyone know of an ST user club in the Wirral/Merseyside area that is open to membership? Please ring 051 678 8519.

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LAMER? Want to swap software, tips, demos and form a Lamers against Lamers Society? Then contact, Faisal Patel, 73 Track Road, Batley, W. Yorks, WF17 7AB.

LIST the low income ST User Group for students and the unemployed send two blank disks to Marcus, 9 Days Green, Chapel Street Mary, Ipswich, Suffolk IP9 2HZ for details.

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ST user: Help! I'm Australian and have just bought an ST (used to own a C64 in Oz) Anyway, I am looking for good contacts and also anyone in Bradford interested in starting a users group. Contact David Marshall, 5 Highfield Road, Five Lane Ends, Bradford, W.Yorks.

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TO PCW beginners. Locoscript, Newsdesk International. SAE to: John Peters, 299 Southway Drive, Southway, Plymouth, Devon, PL6 6QN. Share a problem, find an answer!

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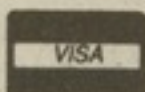
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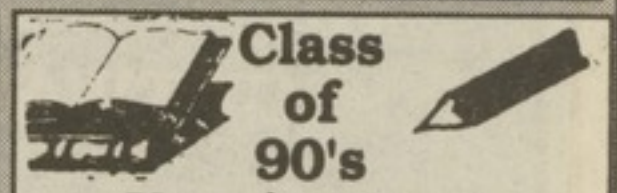
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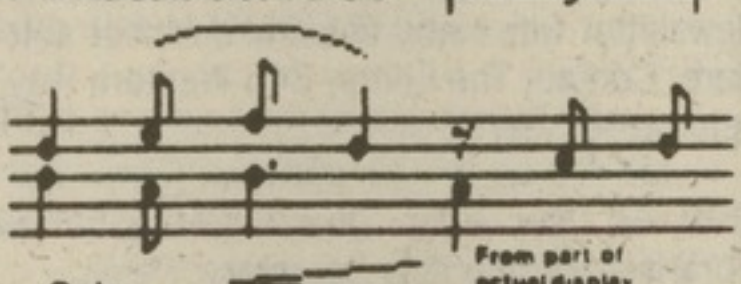


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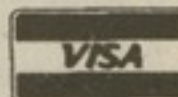
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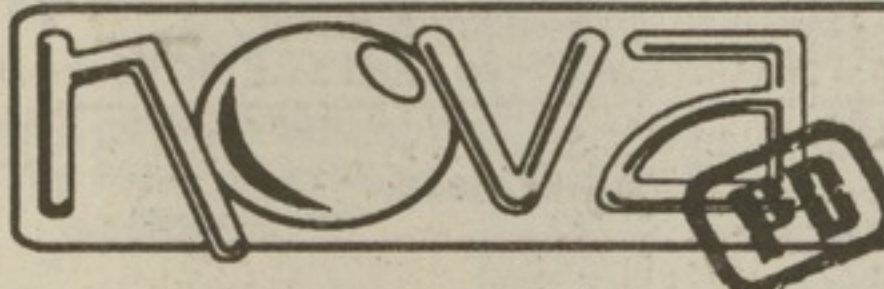
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Back in the early days of home computing, when machines were considered 'elephantine' if they offered 64K of RAM, new and original games popped up every other week.

One month might be the turn of the platform arcade shoot-'em-up, next month we'd all be playing intricately woven adventure games that could handle real English-like commands such as "Go north, pick up the green sword and kill the Elf...". Nowadays, unfortunately, most games are simply variations on a theme, but it is still possible to come up with a really inventive, original and addictive game and *Tetris* is that game.

Devised in the Soviet Union, *Tetris* was released across all formats and became a huge bestseller. The game is simple enough. A series of shapes such as an L, a square, an oblong and so on, tumble down the screen and you have to be rearrange their orientations in order to build up lines without gaps at the bottom of the screen.

Each complete line that you construct is removed from the screen and adds to your score. If you don't manage to remove lines, they will eventually build up until there's no more room on the screen and the game is over.

Easy to play, but exceptionally difficult to master (it's said that the game was used to determine the spatial skills

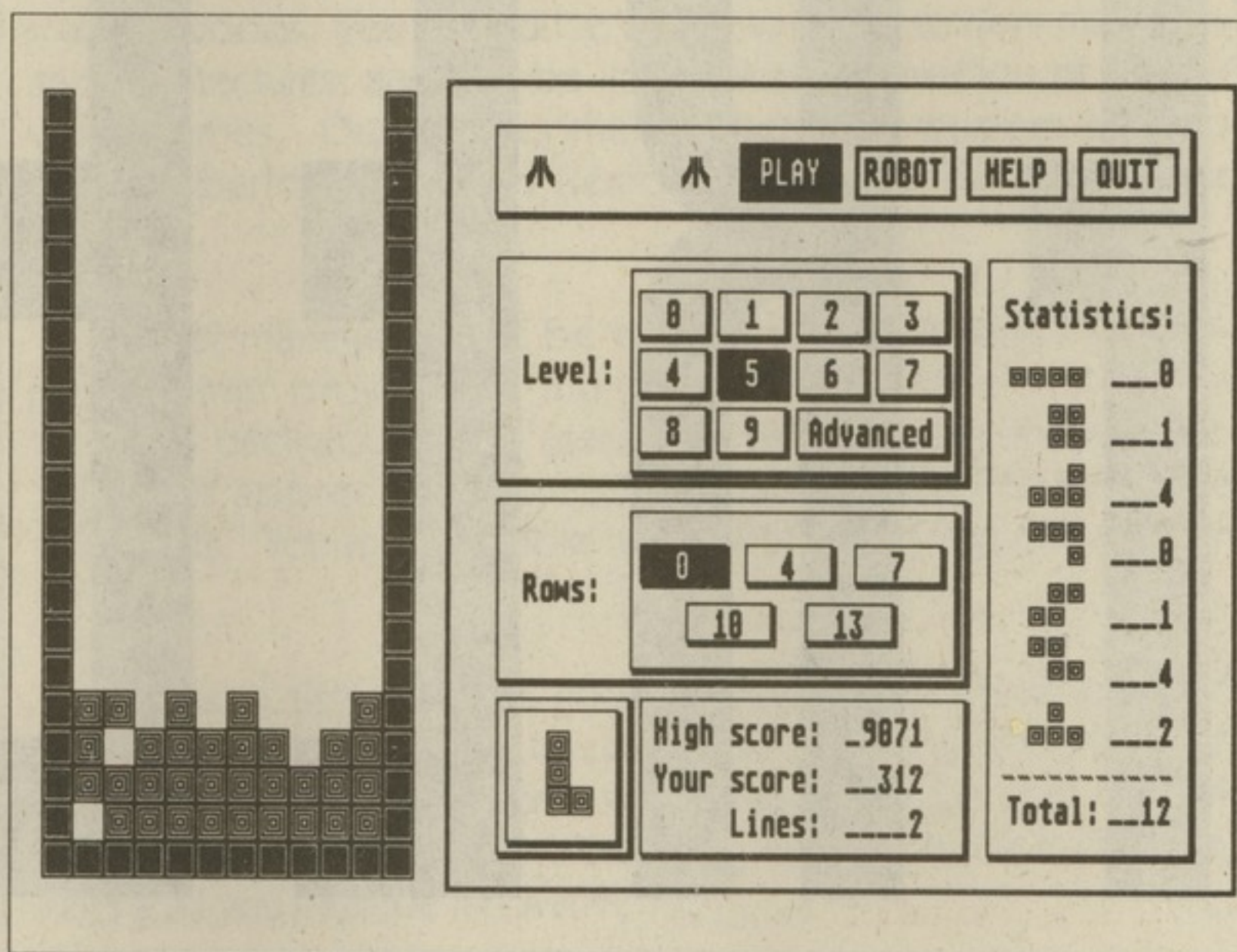
THE PD COLUMN

There is a lot of software out there available for the price of a disk. Our weekly column by Jerry Glenwright explores the world of the public domain.

of prospective employees), *Tetris* is an excellent test of co-ordination.

On the ST, however, the game was less than well-done. Instead of the two dimensional, gray-scale tumbling blocks, the ST conversion featured 'three dimensional' coloured blocks that were heavy on the eyes and difficult to position correctly. *Tetris* for the ST never quite achieved the enormous sales it had clocked up in other formats. Now however, a public domain version of the game is available which is much closer to the original ideal.

At the beginning of each game you can select from a variety of options such as Level (simple to advanced), Rows (the number of rows you want to begin with on screen - selecting 13 rows makes the game fiendishly difficult and only seasoned players will cope with >



• Superbly drawn shapes in the PD version of Tetris.

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this option), Help, which shows you exactly where to position the next shape, then drops that shape, and Robot, which automates the positioning process and enables you to watch the game as it should be played.

Each new shape is shown while the current shape is tumbling, there's an on-screen scoreboard and high score table and a table of statistics so you can see exactly how many shapes have fallen and of which type.

All in all, this PD version of *Tetris* is what the original conversion should have been. Well-drawn gray blocks, smooth movement and lots of optional extras make this PD game one of the best versions around.

PC AND COMPATIBLES

And now, a program for those of you whose fingers must be prised from the keyboard in order to stop playing the *Beast* game which I mentioned a couple of weeks ago. *Lazy-Letter* is an automatic letter writing program that will generate that all-important missive to your aunt and uncle or grandparents simply by selecting a few choice phrases from appropriate menus.

The program begins by asking to whom the letter is addressed. Choose from parents, grandparents, friends and so on. You're then presented with a series of menus providing a range of options to enable the program to tailor a letter appropriate to the way you're feel-

ing at the moment. The first menu asks whether you're feeling well, ill, on top of the world and the like and the program continues through questions about the weather, what you've been doing with your spare time, how the prospective recipient of the letter feels and so on.

After asking for your name it produces a letter consisting of the options you've selected along with a few choice sentences of the computer's own devis-

ing. The results from *Lazy-Letter* can be printed or saved to disk and the program can be used to produce funny or quite serious letters. The epistles it writes are really quite credible, certainly I've seen worse thank-you letters.

Don't waste valuable drinking time scribbling begging letters to your nearest and dearest, *Lazy-Letter* and an innocent PC will concoct intricate mis-sives effortlessly. ■

WANTED

Do you run a PD library? Whatever machine you deal with, drop a line to the PD column and we'll cover all the latest software on the market. The address is:

The PD Column, New Computer Express, 30 Monmouth Street, Bath BA1 2AP.

WHERE TO GO...

Many PD libraries advertise in Shopping Express, but these are also worth a look.

ATARI ST

- Goodman Enterprises, 16 Conrad Close, Meir Hay Estate, Longton, Stoke-on-Trent ST3 1SW. The Goodman library is one of the best, with all the latest PD always in stock - and Mike Goodman is a friendly guy, always willing to chat!
- Page 6, PO Box 54, Stafford ST16 1DR. Page was one of the first PD libraries and ranks with the best. The company also stocks a wide range of Atari 8-bit PD (reviewed in the coming weeks) and publishes *New Atari User* magazine.

CP/M

- The CP/M User Group, 72 Mill Road, Hawley, Kent DA2 7RZ. Help, advice and more PD then you can shake a stick at.

COMMODORE AMIGA

- George Thompson Associates, Dippen, Brodick, Aran, Scotland KA27 8RN. GTA stock a variety of products for Commodore's baby and have an excellent PD library.
- Softville PD Service, Unit 5, Stratfield Park, Elettia Avenue,

Waterlooville, Hampshire PO7 7XN. A comprehensive library which also stocks ST and PC PD too.

AMSTRAD CPC

- Wacci UK, 9 South Close, Twickenham TW2 5JE. Bung a couple quid in the post for a latest copy of the *Wacci* fanzine (a very good read...) plus comprehensive lists of PD.
- DW Software, 62 Lascelles Avenue, Withernsea, North Humberside HU19 2EB. The source of *Desk* and many other remarkable PD programs all written by DW himself!

PC AND COMPATIBLES

- Public Domain Software Library, Winscombe House, Beacon Road, Crowborough, Sussex TN6 1UL. The first in the UK.
- Seltec Computer Products LTD, Northumberland House, Staines Business Centre, Gresham Road, Staines, Middlesex TW18 2AP. Seltec stock a large range of quality shareware.

APPLE MAC

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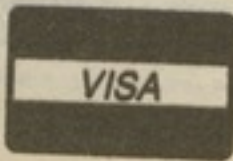
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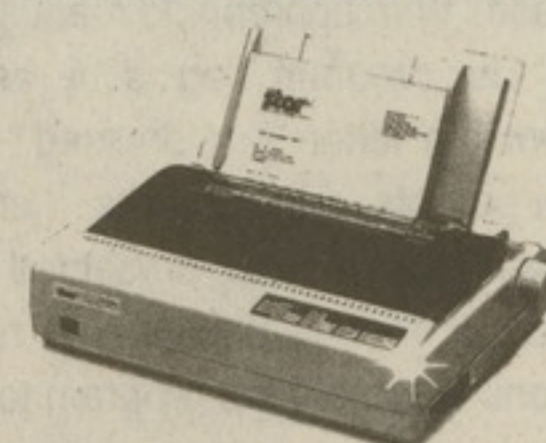
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WORD POWER

For word processing on the move, why buy a full-blown laptop? Keith Pomfret investigates the dedicated alternative...

With a large proportion of portables and laptops used exclusively for word processing, it was only a matter of time before a dedicated laptop word processor appeared.

The Smith Corona PWP7000LT is a fully-portable word processor with a daisy-wheel printer that stays back at the office. Smith Corona is primarily a typewriter manufacturer, and the PWP7000LT shows that. Typists will be glad that it has been designed up from a typewriter rather than down from a PC. Its sole function is to process documents – this it does very well.

The display is a sky-blue LCD, and at the higher brightness levels is very readable. It flickers at lower levels, and although this is annoying it can be cured by altering the contrast control.

Data storage is by a rather fragile-looking floppy disk about three inches across – the size of a PCW disk, but without the protective metal shield. Each disk can hold 100,000 characters.

The word processing features are basic and simple



• The Smith Corona dedicated laptop word processor with its printer.

to use, with the emphasis being on making a typist's life easy rather than putting every last feature into the program. There are no complex file manipulation routines, and merging is limited to a simple mail merge. In short, you type in your text, set the various options from menus or keystrokes, and either save or print.

POWER UP

With the word processor, spelling checker and a thesaurus in ROM, the 7000LT powers up into the program. The spelling checker can be used in the background, beeping if you type in a word it doesn't recognise. The thesaurus offers a 96,000-word list and when activated will suggest an alternative to the word you wish to replace. In a way reminiscent of the Apple Mac, the 7000LT hides all its technical nasties behind a simple front end, making it the ideal machine for someone with a job to do who doesn't want to dirty their hands on an operating system.

Smith Corona suggests that the memory will hold about 25 pages of text. The disk drive capacity is talked of in characters and documents. These are much closer

to the needs of a typist than a capacity in multiples of 1,024 characters you normally get from a computer.

The machine is intuitive to use and all of the features are easy to find from the keyboard. I used the 7000LT for over a week before I opened the manual, and that was only to see if I'd missed anything for the review. A learn option is available from ROM at power up, and this takes a new user gently through the most used features. There is enough in this ROM tutorial to learn the basics of the machine if the manual is lost.

When you do use it the manual is well laid out and illustrations accompany each example.

The daisy-wheel printer produces clattery typewriter-style output with underlining and bold face available. There are options to attach different printers if you wish. There is built-in terminal software that works with the X-modem protocol for transferring files between machines, and – if you have a modem – to and from bulletin boards.

If you want a portable word processor with a printer, the 7000LT is ideal. The price is £699 but it's selling in the High Street for less than £599. ■

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TOP OF THE POP-UPS

You're feverishly tapping away in GFA BASIC when suddenly you find you need to create a text file to be used within your program. The only thing to do is to save your program file, quit to the Desktop and load up a word processor. When you've finished writing the text file you need to quit back to the Desktop and load up GFA again, where the program file must be re-loaded.

It's a common enough scenario, and one which plagues not only the programmer but users of word processors, spreadsheets, comms packages, databases, indeed any kind of serious application. The answer is, of course, to find a desktop accessory. Accessories have the advantage that they can stay permanently in memory and be called up whenever the situation demands. The public domain is littered with them, but even if you can find one to suit your needs, they're not always easy to get to grips with. Now HiSoft has come up with the answer in the form of an imported program from Germany.

Harlekin comprises 18 different programs, all combined into one desktop accessory – but it isn't just a pot pourri of standard desktop accessories. Although there is the usual clock, calculator, RAM disk and printer spooler, the emphasis has been to make desktop accessories of utilities which are commonly only available as separate programs. Consequently, you have a surprisingly sophisticated word processor, a disk editor, terminal software and the scrapbook – an idea which is the heart of *Harlekin*.

To make it operational, you simply boot up with the *Harlekin* disk and then move the mouse into the Desk drop-down menu. Click on 'Harlekin' and up comes a box containing 18 icons – each one being a separate accessory.

UP AND RUNNING

PD accessories tend to have that home-made feel about them. Often they're aimed at programmers who understand the reams of technobabble which can be off-putting to computer newcomers. *Harlekin*, however, is made up of a logical system of GEM windows and icons which ease you painlessly through the applications. If you are still lost, there is a comprehensive 96-page manual which takes a step-by-step approach to explaining each of the utilities.

If you thought accessories were useless way of

Increasingly ST desktop accessories are becoming sophisticated packages in their own right. Mark Higham takes a look at the inexplicably-named *Harlekin*, which combines 18 in one.

filling memory then think again. When you start using the programs, their sophistication will surprise you. For example, the word processor is much more than a bog-standard text editor. Besides the ability to write and edit text, you can also perform search and replace options, adjust tabs, reformat documents, sort words and even print the text complete with page numbers and headers.

The programmers don't make ambitious claims that it's superior to *First Word Plus* or *Protext*, but if

Word Plus – its environment is surprisingly professional. The only real gripe is that text styles such as bold or italics can't be displayed, but even here direct printer codes can be inserted into the text so that a hard copy can utilise all your printer's features.

THE END OF DIARIES

The scrapbook is virtually a program in its own right. It's so useful that you get the feeling the programmers devised it, then added all the other accessories in as an afterthought. It's a configurable utility to enable you to create yearly planners, remember birthdays, addresses and even deadlines.

The scrapbook calls on the word processor to let you write a few sentences, paragraphs or even pages which are treated as notes. Immediately you write a note it's automatically date-stamped, enabling you to sort the information. When you write something you can choose an icon to go with it to mark the text. For example, if you were writing telephone numbers you would use the telephone icon to mark them. Later, when you view the text, a simple click on this icon brings up all the information. Several icons can be used to mark a note so that it can fall into several categories. Urgent notes can also be indicated so that they are specially flagged.

The information held in the scrapbook can be listed on the screen in a variety of ways, for instance as a diary with a list of appointments, or as a calendar presenting monthly information with the same data, or even as a yearly calendar.

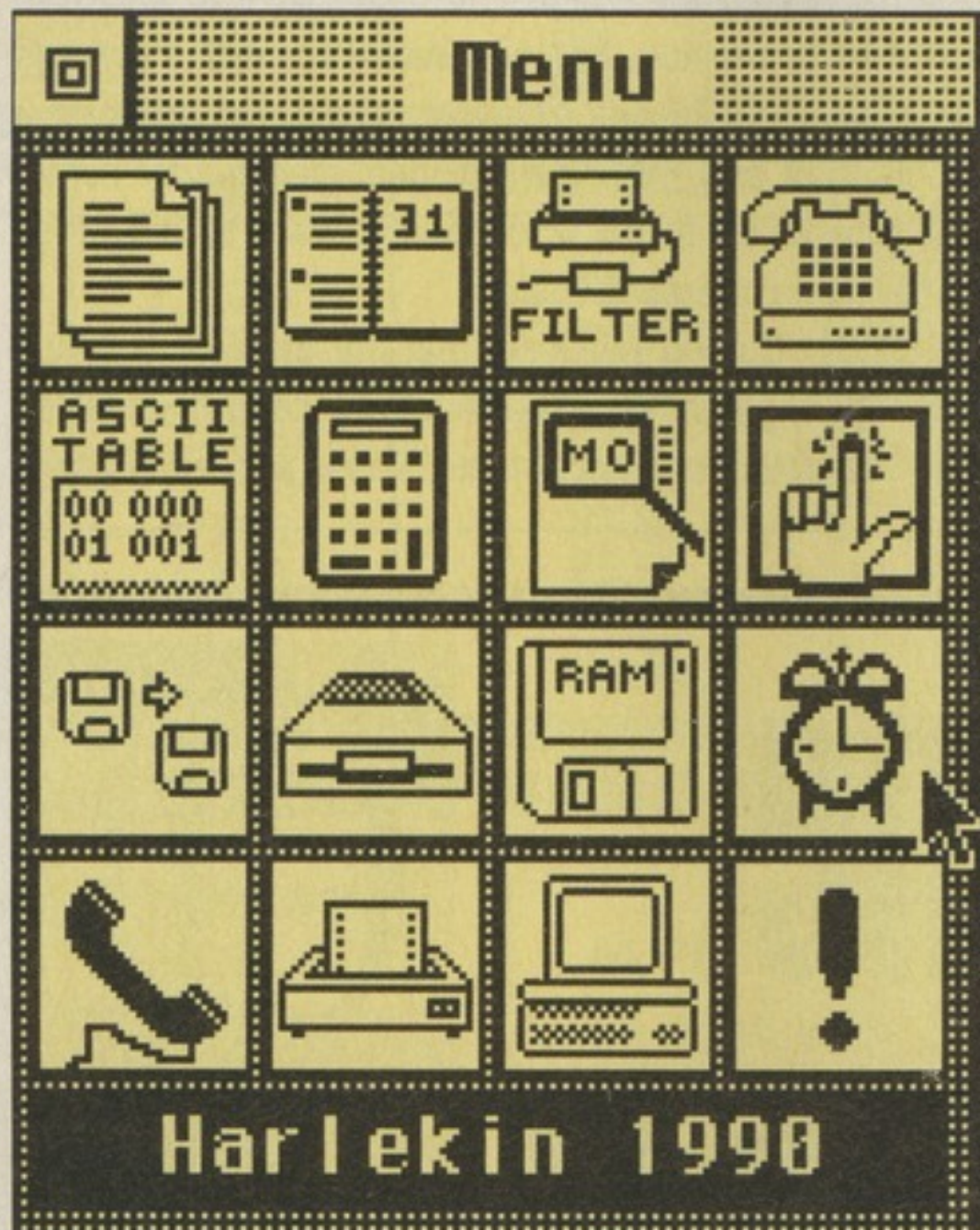
BEST OF THE REST

Harlekin also boasts a useful printer filter. This provides you with the opportunity to intercept and change characters as they are sent from the ST to the printer. The advantage of this is that if your word processor sends out incorrect codes to set page sizes or fonts, you can set up the filter to replace them with something else. You can even re-define characters so that if the pound sign is being printed as a hash you change the codes to convert it back into a pound sign.

Additionally you can set up a maximum of eight printer buttons which send out specific codes to your printer, offering such features as extended line spacing or different font styles.

Then there's the terminal emulator, which is much better than the one contained on your Atari Language disk. *Harlekin* lets you connect your ST directly to another computer with an RS232 port, or to a modem. Here, you can send and receive data. There's also the option to upload and download information using the X-modem standard.

Another handy feature is the memory monitor, appealing to anyone eager to scour the memory or disk contents. A window is used to display and scroll through several sectors at once, showing memory contents in hex form and as ASCII characters. Using a search



• Click on the *Harlekin* drop-down menu option and you're presented with 18 icons. These give you access to a superior word processor, terminal emulator, scrapbook, memory monitor and alarm clock to name only a few.

word processing isn't one of your regular hobbies, there's no reason why you shouldn't find *Harlekin* offers everything you need. With drop-down menus and useful short-cut keystrokes – a feature lacking in even *First*

A MULTITUDE OF ACCESSORIES

One of the biggest limitations when making serious use of ST desktop accessories is the restriction imposed on the number you can hold in memory. Only six accessories can normally be held at once, and if you want to load new ones it's a nightmare. You need to have a variety of disks at hand, each one holding a different combination of accessories. To load a new set, you need to switch off your ST and reboot with another disk. Thankfully, last year ISM released *MultiDesk*,

the answer to accessory problems.

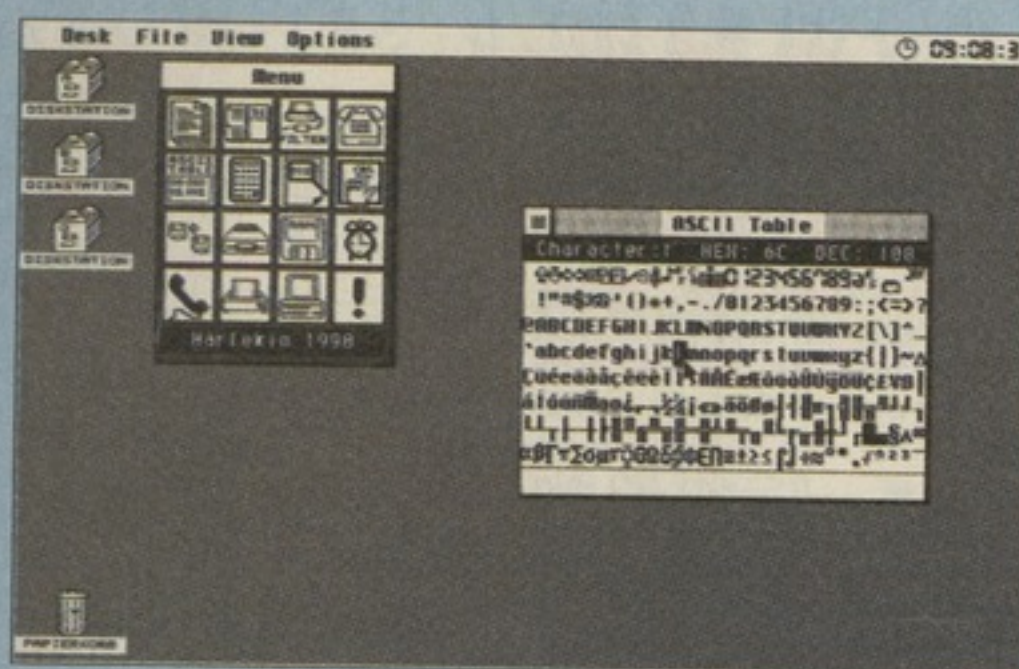
MultiDesk is a single accessory which can load a maximum of 32 accessories and even load and unload new accessories from disk and execute them as if they were stand-alone programs. Clicking on the *MultiDesk* drop-down menu option brings up a full-screen window which shows the names of all the desktop accessories in memory and a set of configuration options. You can set the maximum amount of memory to be used by the acces-

sories and load as many into memory as space permits.

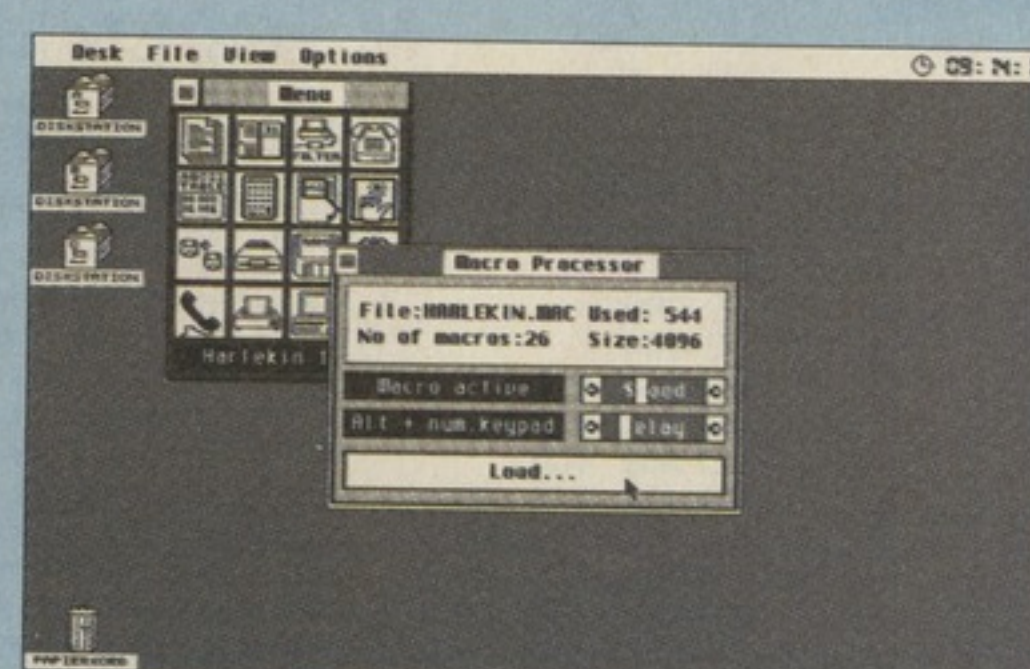
By creating a start-up file, you can also set *MultiDesk* to load selected accessories into memory when you first boot your ST. To execute them, you simply click on an accessory name. *MultiDesk* is surprisingly reliable, letting you run accessories which can be troublesome under TOS.

MultiDesk costs £29.95 and ISM can be contacted on 0983 864674

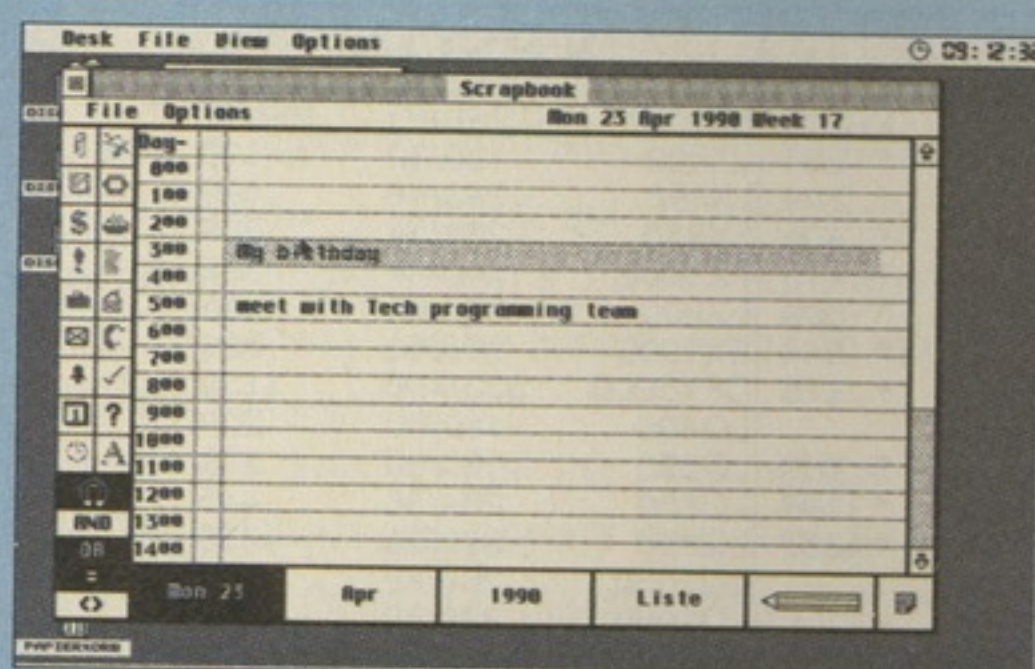
• Some of Harlekins' 18 features, all of which can be called up at the drop of a menu from within any program. Especially useful as 'pop-ups' are the word processor and the comms program – these frequently save you having to quit out of an application to perform a simple task.



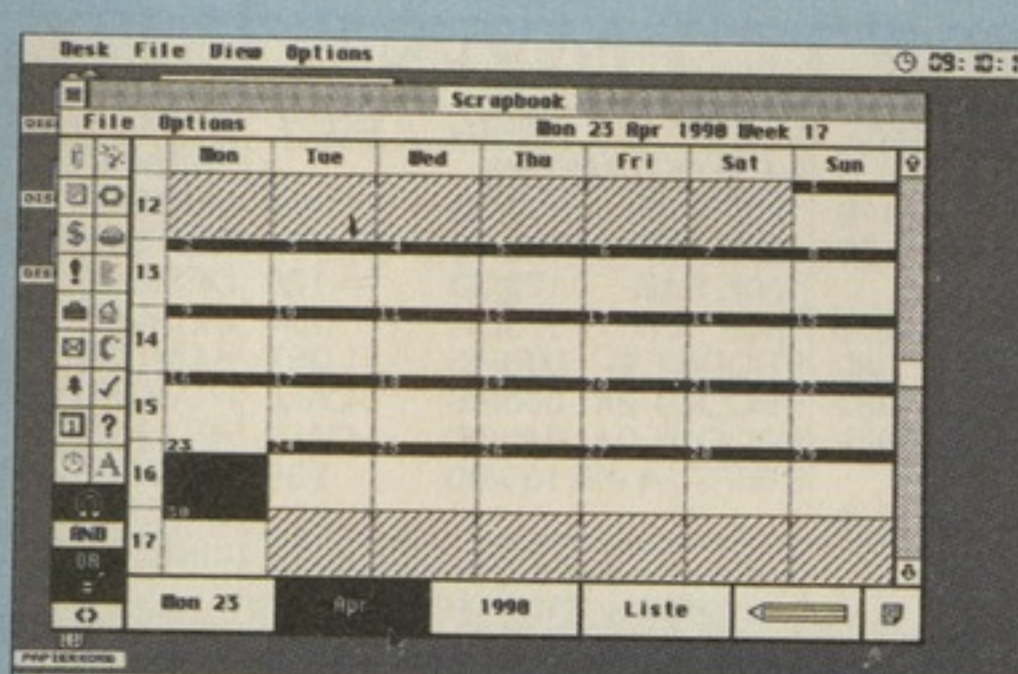
• The ASCII table is an invaluable tool for any programmer. Click on a letter and the corresponding ASCII value is shown in decimal and hex.



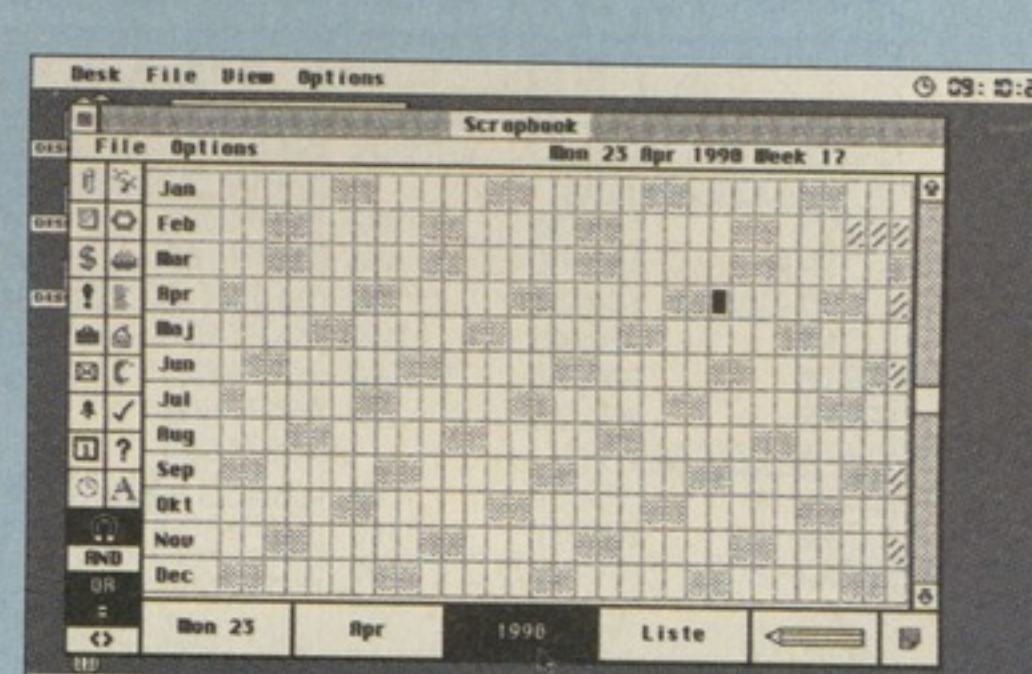
• Use the macro facility to allocate a string of characters to one function key.



• The scrapbook can be used to store notes in a variety of useful formats, from a simple diary structure...



...to a monthly calendar...



...to a year planner.

option you can check disks for those elusive passwords or hunt through memory for specific areas of code.

As if all of this wasn't enough, there's a file utility which enables you to load programs or data files into memory and then copy them out to another disk. Trying to do this from the ST's Desktop is a nightmare and often necessitates creating an intermediary RAM disk. This saves you that effort by loading selected files into memory and saving them again later. The only problem is that it won't copy complete folders.

WORTH THE MONEY?

Apart from the scrapbook, there is little about *Harlekin* which is new. Where it does score highly over PD accessories is in the way it is presented, tidying up many of idiosyncrasies found in the PD to give a GEM-orientated, user-friendly system. The programmers have looked at what was wrong with other accessories and improved them to the point that even the standard font has been changed – *Harlekin* replaces the ST system font for a more Mac-like one when you load it up.

The word processor is vastly better than the traditional text editor and the terminal emulator is almost a comms package in itself. However, it is hard to see how anyone would use either to replace their existing software because both are lacking in the kinds of additional bonus features found in dedicated software. If you make very infrequent use of word processors or comms packages, you are going to find *Harlekin* invaluable.

The scrapbook, however, doesn't exist anywhere else. There is currently nothing like it on the market and it is so versatile you end up wondering how you ever managed without it.

If your ST is surrounded by Post-It reminders, desk diaries and scraps of paper, or if you regularly switch between a variety of applications to perform only the smallest of tasks, you're going to find *Harlekin* essential. There's no other desktop accessory which can touch it. ■

Harlekin runs on all STs and costs £49.95. It can be obtained from HiSoft on 0525 718181.

TOP OF THE CHARTS

The public domain is full of accessories which can be used to perform many of the features found in *Harlekin*. Here's a top 20 of DAs, most of which can be found at either the South West Software Library (PO Box 562, Wimborne, Dorset BH21 2YD) or Softville PD (0705 266509)

ADDPRINT

An address database and printer utility. Holds addresses on file and can be used to print out the labels.

AUTOSAVE

Designed to run with *First Word Plus* and saves your work at regular intervals. Invaluable.

CONTENTS

Lists files, folders and used memory. One of the best directory-type programs available.

DIARY 1.5

Enables you to create notes and reminders which are stored and then displayed in a separate window.

FONTKIT

ST screen and Degas font designer/editor. An extra disk of fonts can be purchased, to give you some to play with.

MULTI-DESK DEMO

A demonstration of *MultiDesk*, enabling you to have up to 32 accessories resident in memory.

GOODIES

Provides RAM disk, clock, backup utility and undelete file options..

GULAM

Shell and command line interpreter. Replaces the Desktop for a PC-style screen. Over 60 commands to create folders, copy, move, catalogue and delete files.

HEAD START

Allows you to auto-boot any GEM program.

PHONECALC

If you have a Hayes-compatible modem, *Phonecalc* keeps a list of the number of times your telephone rings.

PICSWITCH 0.7

Enables you to convert pictures from one format to another or print them. Supports *Neochrome*, *Tiny*, *Degas* and *MacPaint* file formats

QFIND

Lets you find any program without having to open folders. Particularly useful for hard drive owners

RETRACE

Lets you record the actions of your mouse and keyboard and then replay them at will.

SCHIZO

Extremely useful control panel to

replace the one which comes on your language disk. On a colour system you can set up three colour combinations and switch between them with a single mouse click

ST RAMDISK

A re-sizeable RAM disk and printer spooler. It can be set up to automatically copy files into the RAM disk on start-up.

SPEEDMOUSE

If you find your Atari mouse a little too slow, don't go out and pay £30 for another. This utility makes him hurtle around.

SYSTEM

Combination of accessories offering a clock, terminal emulator, colour set, notepad and DOS shell.

TINY TOOL

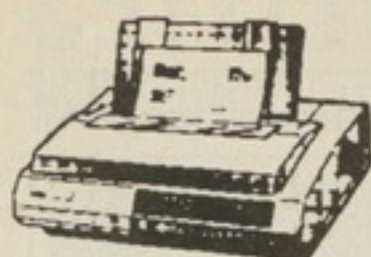
A disk and memory editor to let you change the contents of memory or disk. Particularly useful for programmers.

UNDELETE

If you accidentally erase a file from disk this utility can be used to find it again.

USEFUL

This sets the time and date and displays a clock in the menu bar. Can also be used to save screens as Degas picture files



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MODEL SPEED PRICE 9 PIN DOT MATRIX LC10 144/36 122 LC10-II 180/50 148 LC10-Colour 144/36 159 LC15 180/45 249 FR10 300/76 * 282 FR15 300/76 * 376 24PIN DOT MATRIX LC24-10 200/67 194 LC24-15 200/67 318 XB24-10 240/80 * 368 XB24-15 240/80 * 494 LASER 8 8PPM * 1179 LASER 8 D 8PPM * 1599 STARSCRIPT 8PPM * 1797 RIBBONS MONO COLOUR LC10 3.50 5.50 LC24-10/15 4.50 FR/XB10/15 6.00 12.00 SHEETFEEDERS CALL	MODEL SPEED PRICE 9 PIN DOT MATRIX KXP1081 144/28 119 KXP1180 192/36 139 24 PIN DOT MATRIX KXP1124 192/63 219 KXP1624 288/65 362 KXP1695 362 KXP1654 CALL LASER PRINTERS KXP4450i 11PPM * 1239 ACCESSORIES RIBBONS S/FEED KXP1081 5.80 KXP1180 5.80 70 KXP1592 5.80 161 KXP1595 5.80 161 KXP1124 5.80 80 KXP1540 6.90 161	MODEL SPEED PRICE 9 PIN DOT MATRIX 120D PAR 120/25 107 120D SER 120/25 124 180E PAR 173/30 128 180E SER 173/30 154 PRODOT 9 300/45 267 PRODOT 9X 300/45 CALL PRODOT 24 240/60 CALL SWIFT 24 PIN 180/60 239	MODEL PRICE THINKJET * 254 QUITEJET * 344 QUITEJET + * 406 DESKJET * 419 DESKJET + * 509 PAINTJET * 644 RUGGED WRITER * 875 HP LASERS LASERJET IIP * 809 LASERJET II * 1199 LASERJET IID * 1857 JUST RELEASED LASERJET SERIES III CALL	MODEL SPEED PRICE LX400 180/30 130 LX850 240/48 199 FX850 264/54 329 FX1050 240/48 393 EX800 300/60 459 EX1000 300/60 599 DFX5000 533/400 1139 LQ400 180/60 209 LQ550 180/60 279 LQ850 264/88 445 LQ860 290/88 499 LQ1050 264/88 589 LQ1060 290/88 639 LQ2550 400/133 899 TLQ4800 250/83 1499 SQ850 600/198 499 SQ2550 600/198 863 GQ5000 LASER * 859

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A1 PLOTTER	A3 PLOTTER	CANON	DISK DRIVES	MONITORS
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LANGUAGES	INTEGRATED	SCOOP PURCHASE
BASIC COMPILER V6 146 C COMPILER V5.1 202 COBOL COMPILER V3 358 FORTRAN COMPILER V5 202 MACRO ASSEMBLER V5.1 75 PASCAL COMPILER V4 137 QUICK BASIC V4.5 49 QUICK PASCAL 49 SORT V1.01 98 TURBO ASSEM-DEBUG 78 TURBO BASIC 36 TURBO BASIC DB TOOLS 36 TURBO BASIC ED-TOOLS 36 TURBO C PROF V2 120 TURBO C V2 60 TURBO PASCAL V5.5 60 TURBO PASCAL PROF V5.5 120 TURBO PASCAL DEV LIB 138 TURBO PASCAL DB T/BOX 36 TURBO PASCAL ED T/BOX 36 TURBO PASCAL GAMES 36 TURBO PASCAL GR/TBOX 36 TURBO PROLOG 60 TURBO PROLOG T/BOX 36	ABILITY 59 ABILITY PLUS 115 FIRST FRAMEWORK 56 FRAMEWORK III 325 LOGISTIX 115 OPEN ACCESS II PLUS 357 PFS FIRST CHOICE 76 SMART SYSTEM V3.1 350 SMARTWARE II SYSTEM 348 SYMPHONY V2 370 WORKS V1 94	COMPUTER, PRINTER & SOFTWARE BUNDLE £299 + VAT SANYO MBC 550 COMPUTER, MSDOS 2.11, 12" AMBER MONITOR, 135CPS DOT MATRIX PRINTER WORDSTAR WORD PROCESSING AND CALCSTAR SPREADSHEET-HURRY WHILE STOCKS LAST ULTIMATE BUSINESS MACHINES LTD 23 ALBION ROAD EARBY COLNE LANCASHIRE BB8 6PZ (0282) 844044 VISA & ACCESS FAX (0282) 843840 DELIVERY CHARGES UK MAINLAND NEXTDAY 4-DAY HARDWARE £15 £10 + VAT SOFTWARE £10 £8 + VAT CONSUMABLES £5 £3 + VAT



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PC MUSIC: DOING IT THE EXPENSIVE WAY

Did you hear about the chap who pulls up and asks a native of an unfamiliar town for directions? After a lengthy set of instructions the native rustic concludes: "Well, if I were you, I wouldn't start from 'ere anyway". To be honest, music on the PC is in much the same position.

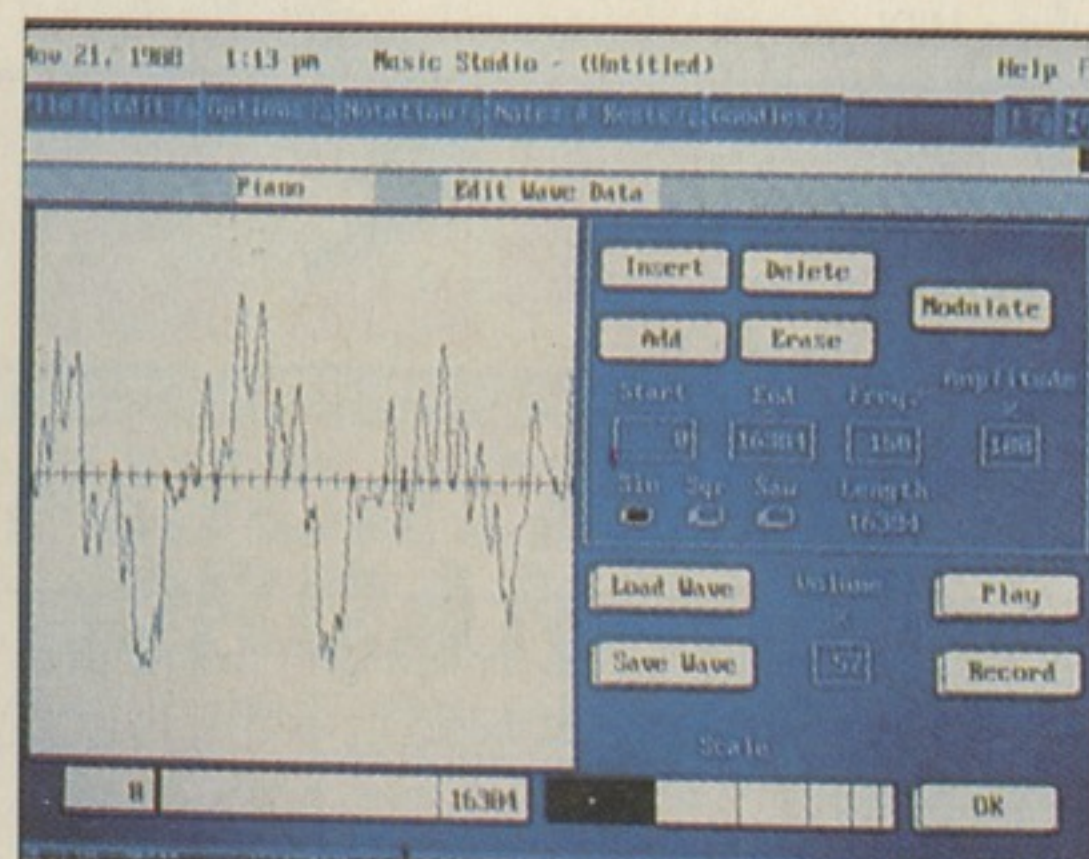
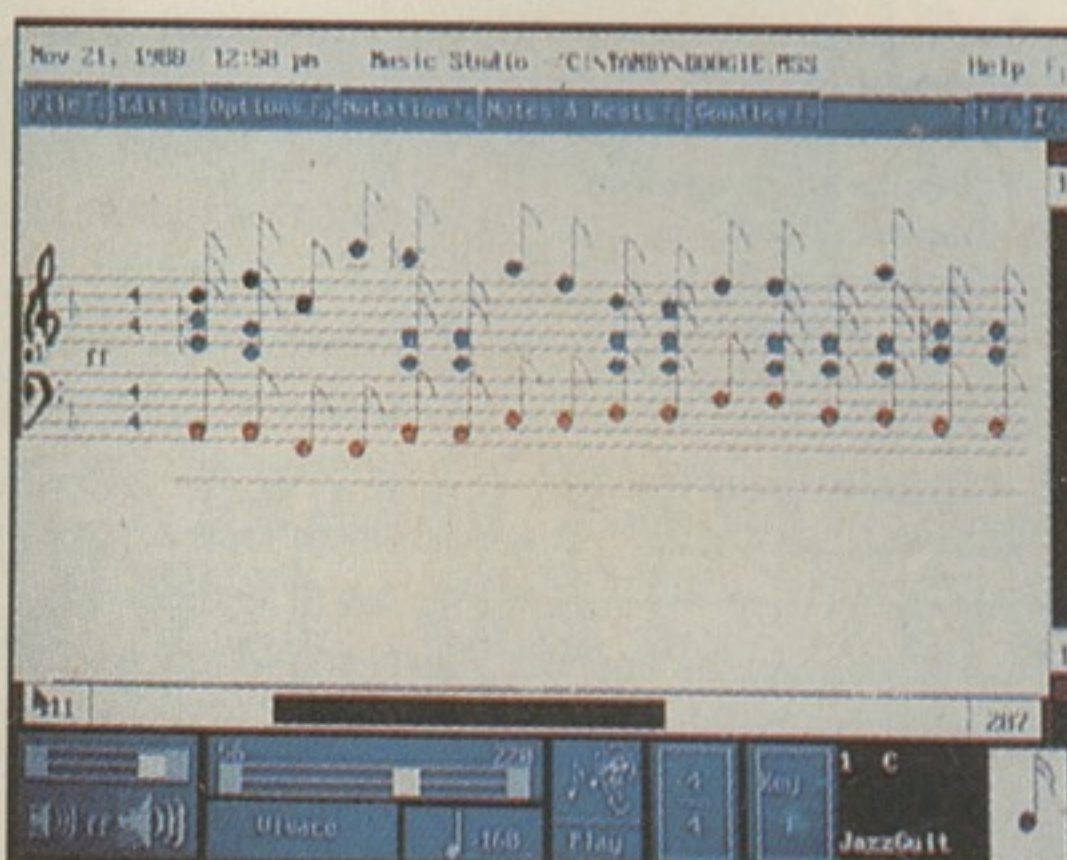
It is without question that the machine has been tried and tested above and beyond the call of duty, but would you buy it if music was uppermost in your mind? I'm afraid the answer would have to be no. This has very little to do with the software available, more the market that the PC has penetrated in the UK. The PC is nearly always perceived as the business machine and not particularly as the home entertainment centre. Music comes under the heading of entertainment, whether for the user or listener, so in Europe music software for the PC has not fared well. As we shall see though, the American market is very different.

COMPATIBILITY PROBLEMS

A major stumbling block is compatibility. MIDI is the internationally-agreed communication standard that can get musical devices and computers talking on the same level and achieve a high degree of intimacy if so required. No compatibility problems here. The problems set in with the internals of the PC and its clones.

Like most computers, the PC (with one exception, see Not a Lot of People Know That...) does not leap out of the box brandishing a set of MIDI ports under your nose. You have to buy them as a separate interface, usually as a slot-in card, which is where the problems start. There is no standard agreed on the internal

With the price of MIDI interfaces on the PC you'd be unlikely to choose the PC solely to make music, but there is still a good range of software available, finds Jon Bates



• The Music Studio allows on-screen editing in conventional notation (left) as well as direct control of the sound chip (right).

addresses used for the MIDI interface. This creates a lot of fun when using software from different companies, as it is quite common that software is not compatible with the interface used.

The 'industry standard' interface, in so far as there is one, is the Roland MPU 401 and its upgrades. This is a very well equipped interface that not only accepts and works with MIDI, but can also convert the pre-MIDI time clocking system known as CV (Control Voltage).

The Roland 401 interface comes in at an unfriendly price – about £250 – so the thing to do is to spot other interfaces that are compatible with the 401. Anything that is will say so on the box and advertising blurb, and will be cheaper, although probably sacrificing some parts on the way.

However it is rare that any MIDI interface for the PC will cost you less than a wallet-numbing £100.

INTERNAL SOUNDS

Here we are in the familiar territory known to many other computer owners. The old sound chip will bleep and bloop its way on three channels simultaneously, but the bottom line is that there's no serious work to be done here. If a fun-time, low-cost approach is what you seek then I would rake through the public domain libraries – there are several programs that variously transform the QWERTY keyboard into a piano keyboard or let you assemble your own tunes.

HALFWAY HOUSE

Somewhere between internal sounds and MIDI is *The Music Studio 3.0* from Activision. It is a jack of all trades, although not a perfect master of any. It uses sampled instruments played back via the internal sound chip and can handle up to 15 at one go, although it will only play back four simultaneously.

Composition is achieved by two methods. You can either stick traditional notes onto a staff or, by using a MIDI interface, play in tunes and the program will play them back. It comes with a set of demonstration tunes that are bordering on the mediocre but nevertheless give you a rough idea of things.

Writing songs and tunes is quite a laborious ➤

NOT A LOT OF PEOPLE KNOW THAT...

...the one exception to the PC without MIDI is the Yamaha C1-20. It is a portable with an LCD screen, 20Mb hard drive, 640K RAM, three MIDI ins and eight (eight!) MIDI outs

and an SMPTE port. It comes complete with Yamaha sequencing software. Its original price was a shade under £2,000 but shop around for silly offers at present.



• The Yamaha C1 offers MIDI portability.

...for £3,000 you can have not only a PC but also a digital recording and playback device that will beat a CD in quality. Digigram will be offering a direct-to-disk recording system in the very near future with editing,

cross-fading and other goodies. If you tot the figures up against a DAT machine (Digital Audio Tape recorder) plus editing features, plus a PC with hard disk, it represents a considerable saving.

Flick from compound maths to Simple Minds in one keystroke, anyone?

...there is a French MIDI sequencing program for the PC called *Use Fool*. (The advertising copy should be a joy to behold!)

...the score for the current horror film *Shocker* was created using a PC. Cakewalk sequenced the music and sound; sounds were created using the *SoundGlobs* universal editor.

process and of course it does rather presume that you can read and understand notation.

The editing features are quite good though, with block marking, cut and paste and you can have two songs resident at any time. The MIDI function is good enough to give you a taste for things to come, and you can quantise notes – correct the timing – but only as you record and not after. Part of the program is dedicated to designing new sounds from the old ones by redrawing the waveform displayed on screen.

In one or two respects *The Music Studio* is sophisticated, particularly in the global functions that you can apply to the music. It does make quite a decent beginner's program, but don't forget that to use MIDI you will need to lash out on that interface. The good news is that the program is available at very silly discount prices and so you should expect to pay about £20.

Sadly there is not too much around for the fun-loving PC owner who wants a gentle introduction to music.

MIDI SOFTWARE

The USA is the home of PC MIDI software, as this is the market where music has penetrated the most, more due to the availability of the PC and its large market than anything else. Just available in this country is a very

simple to use and relatively low-cost MIDI sequencer called *Prism*.

It is bristling with clever state-of-the-art features: cut and past editing, event list editing (so-called 'data stream editing'), multiple channel recording, the ability to loop sections and record over them until you get it right, programmable graphs for manipulating time, pitch

and all MIDI data. You can even configure the screen layout to suit your own preferences.

The concept of *Prism* is that you create patterns that you can then link together to form a song. You are limited to 32 different patterns in a chain that can be up to 50 patterns long – linking them is a little idiosyncratic. The copious but direct manual that accompanies *Prism* is absolutely ideal for the beginner. I myself would have preferred graphic editing for notes rather than a screen full of numbers, but

Prism is probably the best entry-level sequencer around for the PC.

HEAD FOR THE HEIGHTS

If we look past the near horizon of entry-level software then we head for the dizzy heights of the fully-fledged professional software, of which there is quite a lot for the PC. Since there is such a large market in the States



SERIES



- Compose and Play Music
- Create Your Own Sounds and Instruments
- Real-Time MIDI Input/Output

ACTIVISION

to be appeased, many a successful sequencer has started life on the PC to be crossed over to the more familiar territory (for us) of ST, Amiga and Mac.

It is also fact that there are not now so many new sequencers produces for the PC, especially in the upmarket field. *CakeWalk Professional 3.0* which is due on the market even as my fingers stab away could well be one of the last.

It is a highly sophisticated multi-track MIDI recording suite that can have up to 256 independent tracks and some fairly high-level editing and control. It also has an option that should appeal to the programmers: you can program your own routines in its own CAL language and store them within the program. Routines can, for example, thin out incoming data, put chords in automatically and randomise some of the timing or accents.

Once written into the program they are available at a keystroke. CAL is not for the faint of heart though as it resembles LISP and C. *Cakewalk* will set you back a cool £150. Other names to conjure with in the PC music world are *Voyetra*, *Master Tracks*, *Texture*, *Score*, and *Finale* to mention but a few.

PLENTY AROUND

There is actually PC music software to cover every professional and semi-professional need, although, as we have seen, the fun-time beginner's stuff is not so easy to find.

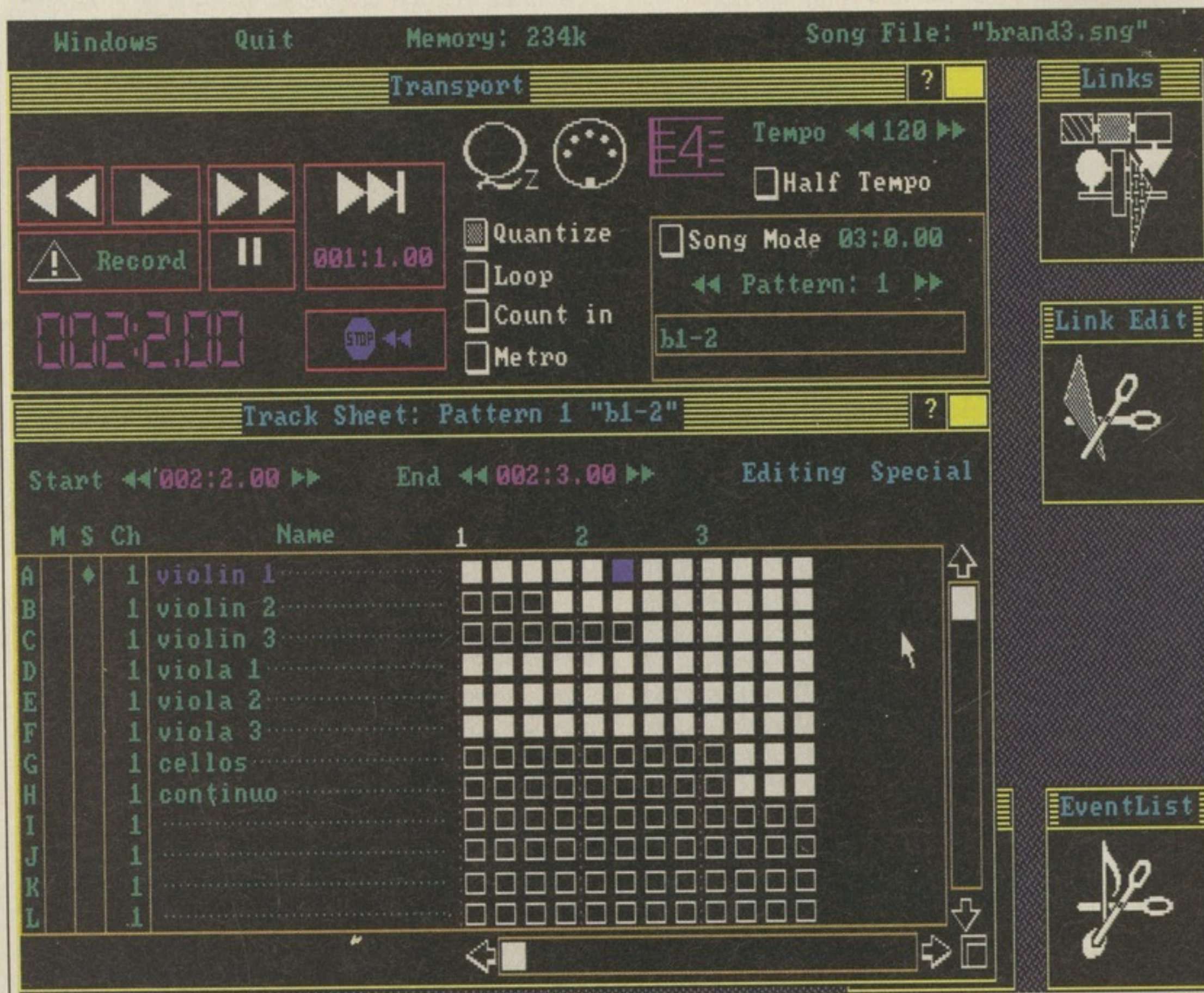
If you have a PC and are really serious about music then it might be an idea to look at some American computer and music magazines and maybe even order the software direct, as in quite a few instances there is no distribution in the UK.

You might also profitably spend a little time looking through the adverts in UK magazines as there are PC specialist shops that will be far more help to you than a general music software shop. ■

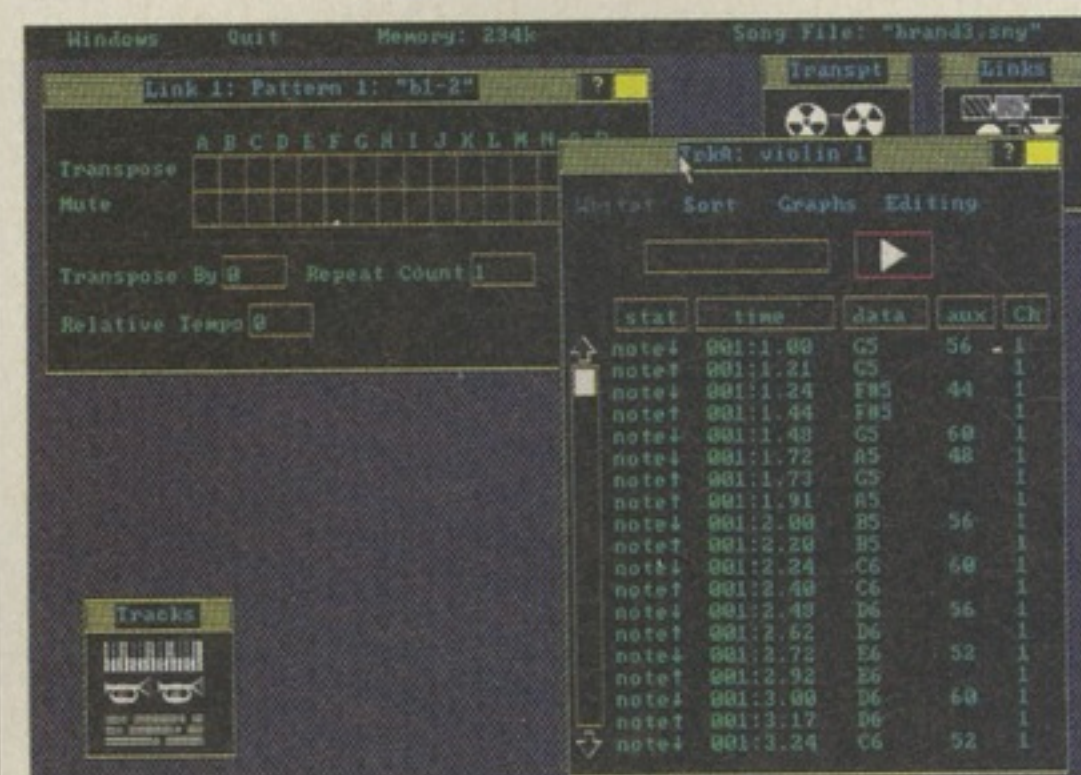
NEXT WEEK

Next week we have a look at the software on offer for the venerable Sinclair Spectrum and the brand new SAM Coupé.

Any points or queries you have please write to me at *New Computer Express*, Future Publishing, Beauford Court, 30 Monmouth Street, Bath BA1 2AP, before the end of this week as then I can be sure of answering you in print. Mark all letters for my attention.



• Prism allows you to sequence many instruments simultaneously. Each window can be dragged and resized independently, giving a very flexible user interface.



• Song editing in Prism uses strings of numbers to define the melody – a rather awkward system.

★ POCKET SIZED ★ PC-COMPATIBLE ★ PERSONAL ORGANISER ★



ATARI Portfolio



THE PC IN YOUR POCKET

The new Portfolio from Atari is the world's first pocket-sized electronic organiser that is also a powerful PC compatible computer, with a full QWERTY keyboard and scrolling 80x25 character display.

Portfolio includes everything you would expect from an electronic organiser - an address and telephone book, time manager, diary and sophisticated calculator.

Portfolio also includes several functions that you would not expect - a spreadsheet for your personal budget and expense records, as well as a text processor for typing memos and letters.

And, because Atari's Portfolio is PC compatible, it can communicate with your desktop PC at home, or in the office. You can transfer files from one to the other, to enable you to update your reports and figures with the Portfolio while you are on the move.

FOR
ONLY

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INC
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SPECIFICATION

- ★ **Processor:** Intel 80C88 at 4.9152Mhz.
- ★ **Operating System:** Compatible with MS-DOS 2.11.
- ★ **Internal ROM:** 256K containing BIOS, operating system and applications suite.
- ★ **RAM:** 128K with an internal RAM disk, configurable from 8K. Externally expandable to 640K RAM.
- ★ **Keyboard:** 63 keys, QWERTY, IBM PC BIOS compatible. Buried numeric pad and function keys. Optional key click.
- ★ **Character Set:** Extended IBM ASCII (255 characters).
- ★ **Mass storage:** credit card sized memory cards (32K or 64K or 128K RAM).
- ★ **Display:** Graphics LCD, supertwist technology, MDA compatible, 40 columns x 8 lines, 240 x 64 pixels (with the option to window a full 80 x 25 character display). Keyboard controlled contrast.
- ★ **Peripherals:** 60 pin expansion BUS to take serial and parallel ports and memory expansion units.
- ★ **Size:** 8" x 4" x 1" (200mm x 105mm x 29mm).
- ★ **Weight:** 495 grammes (with batteries).
- ★ **Applications:** calendar and diary, address and phone book, Lotus 1-2-3 compatible spreadsheet, text processor, communications software.

5 BUILT-IN APPLICATIONS! TO GET YOU ORGANISED!

To get you started, Portfolio comes with a suite of five useful functions built-in, all accessible from a simple menu display.

TIME MANAGER

More than just an electronic diary, the Portfolio Time Manager enables you to plan your appointments via a comprehensive calendar and diary. It can even be programmed to sound an audible alarm at specific times to remind you of important appointments.

CALCULATOR

Your Portfolio will be invaluable in the office or at home as a powerful pocket calculator. It has a full range of functions, including factorial,

power and root calculations, all with multi display formats and memories.

ADDRESS BOOK & DIALLER

Portfolio has a complete address book facility that allows you to store hundreds of addresses and phone numbers. And, at the touch of a button, you can retrieve any one of them, or search for a specific grouping, such as "all Italian restaurants". And, when you are ready to book your table, hold your Portfolio to your telephone mouthpiece and use its special built-in tone dialler to dial the number for you.

TEXT PROCESSOR

The Portfolio's built-in text processor program

includes word wrap, line and column count, string search, in fact most of the functions you would find in a word processor. It handles printer and word processor control codes and allows easy transfer of files between Portfolio and your desktop PC.

SPREADSHEET

For real calculating power, Portfolio has a Lotus 1-2-3 compatible spreadsheet built-in. It has 127 columns x 225 rows and reads/writes Lotus V1.0 and V2.01 files, so you can transfer data to and from Lotus 1-2-3 on your desktop PC. The Portfolio's 256K ROM includes MS-DOS and PC BIOS compatible systems software.

COMING SOON!

In addition to the excellent software built-in to the Portfolio Free of Charge (see right), other software and peripheral products, such as the sophisticated Pocket Finance package and serial/centronics interfaces are available. And it doesn't stop there. Many manufacturers have recognised the potential of the Portfolio and have already started to design new peripherals and software. Products currently under development include: Serial interface with built in mini modem, Apple Macintosh interface, business, utility and programming software plus a range of adventure and battle strategy games. For further free details on the Portfolio range, fill in the coupon below and return it to Silica Systems now.



MEMORY CARDS

Portfolio can store and retrieve data and programs from its own RAM, or from small credit card size memory cards, that slot into its built-in card drive. The cards are available in three sizes, 32K, 64K and 128K, so you can carry a library of data in your pocket. The card drive also accepts ROM cards, which can contain commercial or custom software.



POWER SUPPLY

Portfolio is powered by three AA batteries which will run for up to six weeks with normal use, or from the mains using an adaptor. All the peripherals take their power from the Portfolio, so no extra batteries or adaptors are required. A 'battery-low' warning and memory back-up ensure that information is not lost when the batteries are changed.



INTERFACES & PERIPHERALS

Portfolio can communicate with other computers and supports a growing range of peripherals via a built-in 60 pin bus connector. Peripherals available include serial and parallel interfaces and memory expanders (to 640K). You can also add a card drive to your desktop PC, to enable it to read/write to Portfolio's cards.

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Before you decide when to buy your new Atari Portfolio, we suggest you think very carefully about WHERE you buy it. Consider what it will be like a few months after buying your Portfolio, when you may require additional peripherals or software, or help and advice with your new purchase. And, will the company you buy from contact you with details of new Portfolio products? At Silica Systems, we ensure that you will have nothing to worry about. Silica Systems is a new division of Silica Shop, the UK's leading Atari specialists. This new division has been established to provide a service to the more serious home user, as well as to business and education purchasers.

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 Which computer(s), if any, do you own?

LEARNING TO DRIVE

The hard disk has become essential for serious computing. Their short access times, large data storage capacities and the ability to keep all normally-used software on the machine permanently have made hard disks virtually indispensable.

Early PC hard disks had the stunningly huge storage capacity of 5Mb and we were astounded by the massive 10Mb capacity of the next generation. Around that time peripheral manufacturers got interested, and with competition the prices got closer to the average person's budget.

WHAT IS A HARD DRIVE ?

A hard disk works much like a floppy in that it stores data on a magnetic disk divided into tracks and sectors. Instead of being a single floppy disk with only two sides, the hard disk contains three or more disks known as platters. These are inflexible (hence 'hard' disk) and coated with a magnetic ceramic material. These platters are divided into concentric tracks and a head, not unlike the tape head in a Walkman but much smaller and more precise, reads the data from the tracks.

The whole unit is sealed up, and because of the dust-free environment around the platters it is possible to get much better integrity of data, and consequently more information on the disk. The read head doesn't actually touch the platten but skims across the surface maintaining a tiny gap between disk and reader. This is possible because of the rigid disks and the finer tolerances in the manufacture of a hard drive.

Between the hard disk and the computer there must be a controller. This is a piece of circuitry which allows operating system commands to be translated into mechanical movements of the head, and incoming data to be converted into a form the computer can understand. Because of this the same disk hardware might be used in a PC, Amiga and ST hard drive, but the controller and interface would be different for each machine.

If you've ever used a hard disk, you'll know there's no going back to floppies. Expensive they may be, but essential for serious work too. Keith Pomfret explains the mass storage options.

When you buy a hard drive, it generally comes with an interface and controller for a particular machine, so one bought for a PCW will not work on an ST.

Hard disks may come in a stand-alone box, as an expansion card, or a separate chassis-mounting component. Some of the largest ones are floor standing. For PC owners in particular it can be a daunting task to decide what physical format to buy. A 20Mb drive may be 'full size' – the size and height of a full height 5.25-

40Mb. When you are talking about hard disks, size truly does not matter.

There are even removable hard drives where a unit containing the platters is detachable so you can move your data without shifting the computer.

Currently overtaking conventional hard disks at the top end is optical technology, with optical disks containing hundreds of megabytes of data. The ability to read and write to optical disks will open a new chapter in the storage story, but it's still a distance away yet from being generally affordable.

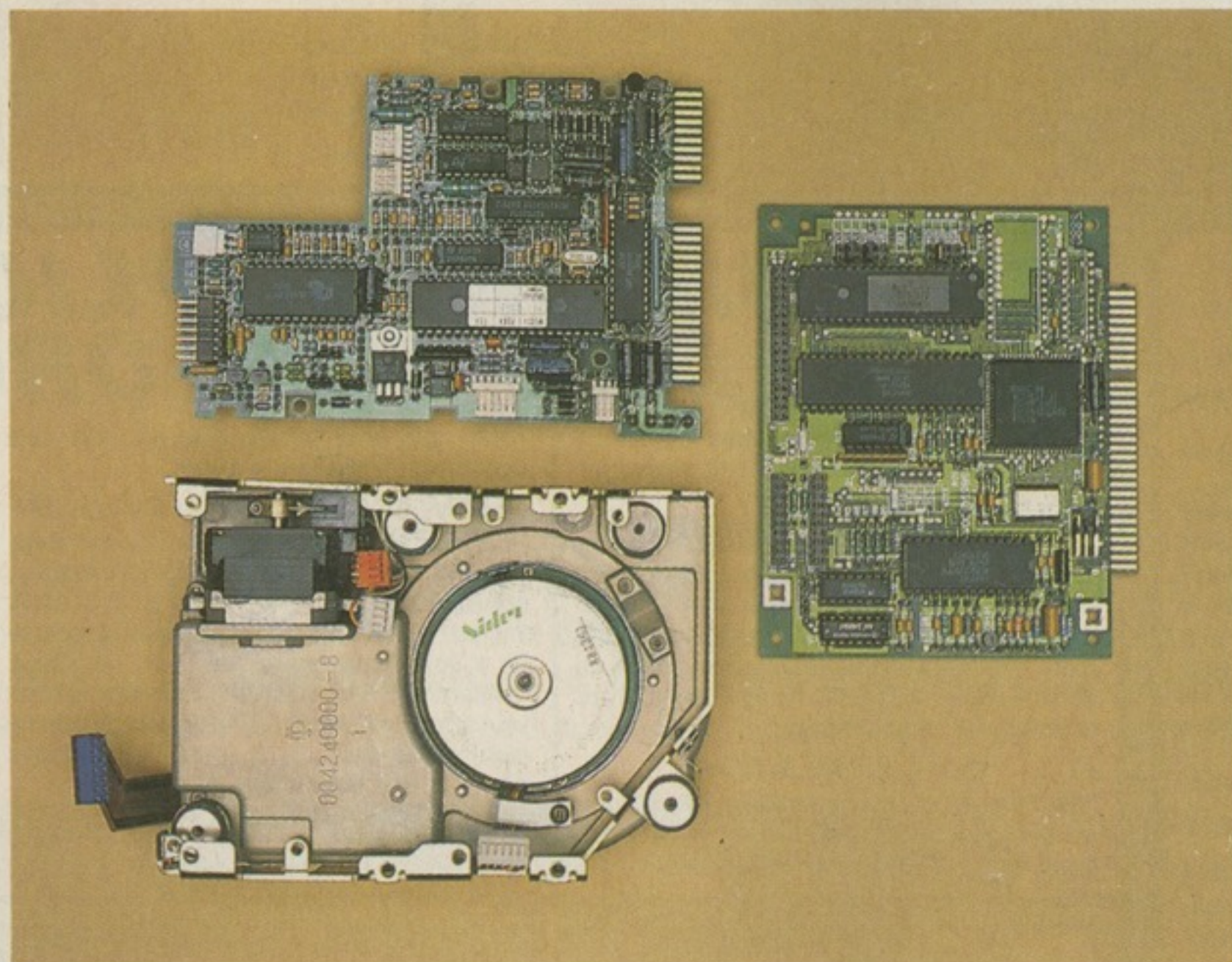
STORAGE SPACE

The smallest hard disks store around 20Mb of data, but the largest ones can handle gigabytes (a gigabyte is 1,024 megabytes). The use that you put your computer to will determine the capacity of drive that you need.

For example, an author might use a PC with a 20Mb hard disk. This would be capable of storing several novels. The only applications they would need would be a word processor, spelling checker and possibly a mail merger to write the same letter to several publishers. At 1,000 words a day they would be tapping the keys for several years before filling the disk.

However, a designer using a memory and space hungry CAD (computer-aided design) package might be struggling for breathing space on the same drive in a matter of days.

Another factor to take into account is the speed of the drive – measured as its access time. In simple terms, the lower the number, the faster the drive works – anything under 40ms is reasonably quick, with the



• *The insides of a hard disk drive: the actual drive mechanism itself (bottom left) is connected to an interface (top) which in turn links to a controller (right). In some machines, such as the ST, the controller is built into the computer.*

inch drive. A 40Mb drive may be the size of a half-height 3.5-inch floppy. The drive may be on a card to fit in an expansion slot – three of these 'hard cards' may look the same but have capacities varying as much as

PC HARD DISKS

The IBM and its compatibles are well covered, with a list of drives, expansion cards and stand-alones that would fill a 24-page supplement. Because there are so many, the prices are competitive

Every dealer, mail-order house and supplier seems to have a good choice, so the thing to do when choosing a PC drive is to take your time and compare prices and specifications. A couple of hundred pounds will buy you a fast, spacious hard card or chassis-mounted drive. It is advisable to have it formatted before you buy it so that you can just plug it in and go with the least fuss.

There are various kinds of disk controllers – RLL, MFM, EDSI and SCSI – so if you buy the drive and controller separately, be sure to check that they match.

A standard PC has trouble with a hard disk larger

than 32Mb, and has to regard a 40Mb drive as two 20Mb ones – C: and D:. This problem has been overcome with the latest version of MS-DOS, 4.01.

SEAGATE ST 225

For under £200 this is the entry-level hard drive for PC owners. With a 65ms access time it is creakingly slow, but when compared to floppies is still quick. It is a bare drive and needs a controller card to run.

WESTERN DIGITAL FILECARD

This is a hard card for a PC with all the necessary controllers and interfaces, and plugs straight into an expansion slot in your PC. The 32Mb version costs around £210 and the 40Mb version about £240.

PCW HARD DISKS

When Amstrad introduced the PCW word processor, there was no thought of adding a hard drive. But with over 500,000 sold in the UK there was a demand, and this has been filled by third-party suppliers. Again, these can be expensive but dedicated PCW users find the expense worthwhile.

DIAMOND HARD DISK

A 32/48/100 Mb hard disk which plugs straight into the expansion port with an optional through connector for those with other peripherals. Prices from about £540 for the 32Mb version.

VORTEX

This firm supplies a 40Mb hard disk. Price around £570.

CPC - NO JOY

German peripheral manufacturer Vortex produced a now unobtainable card some four years ago that allowed the CPC 464 to support a hard drive, and Romantic Robot has left addresses in its RODOS operating system for one, but other than welding a CPC to a 'host' computer with a hard drive, it looks like a non-starter.

best (and most expensive) drives managing 15ms or so. Some applications can be very disk intensive and a long access time can be extremely frustrating. Check that the speed is compatible with your work.

WILL IT FIT?

Some computers come with a hard drive as standard. Some will support more than one drive. Some computers won't support a hard drive at all.

The IBM PC/AT, PC/XT and Apricot F10 are machines that were designed with a built-in hard drive. Most PCs, the ST, Amiga, Archimedes and a couple of the 8-bits can have a hard drive added, but for ZX 81 owners, there isn't much hope.

It is theoretically possible to bolt a hard drive on to any computer, but with the interface and controllers necessary it would be an all but impossible task on some of the older machines.

BUYER BEWARE

There is a honey-covered trap that many an unwitting buyer has fallen into. If you scan the classifieds or attend computer fairs, you may see hard drives offered at bargain prices - a 10 or 20Mb hard drive for a tenner. Sounds like the £1,000 Porsche Carrera doesn't it? These second-hand bargains are usually sold as a simple drive unit with no controller or interface. Imagine buying the Porsche and being told that there is no engine, gearbox and back axle. Check out the drive to avoid having 10Mb bookends.

MAKING THE MOST

After putting up with 360K PC drives for years, suddenly finding a 32Mb disk to keep your work in is like splashing around in a paddling pool only to find one day there's an Olympic swimming pool in your garden.

AMIGA HARD DISKS

Amigas are well supported after a slow start, but the drives can be a little expensive and there can be interface and system problems with some set-ups. It's wisest to make sure that the drive you want will run with your configuration of machine.

COMMODORE A590

This is Commodore's own offering. It holds only 20Mb and has the extremely long access time of 80ms. Like most

manufacturers' own products it is expensive at £574. On the plus side it has sockets for 2Mb of RAM built in. It will only work with the A500.

AMDRIVE

This 30Mb drive is for Amiga 500 and 1000s. No access time is quoted and the price is a respectable £475.

BUROCARE HARD DRIVE

A 40Mb drive for any Amiga with a heart-stopping price tag of £695. BuroCare also does 60Mb and 80Mb hard drives at £795 and £895.

HDA 506-1/5

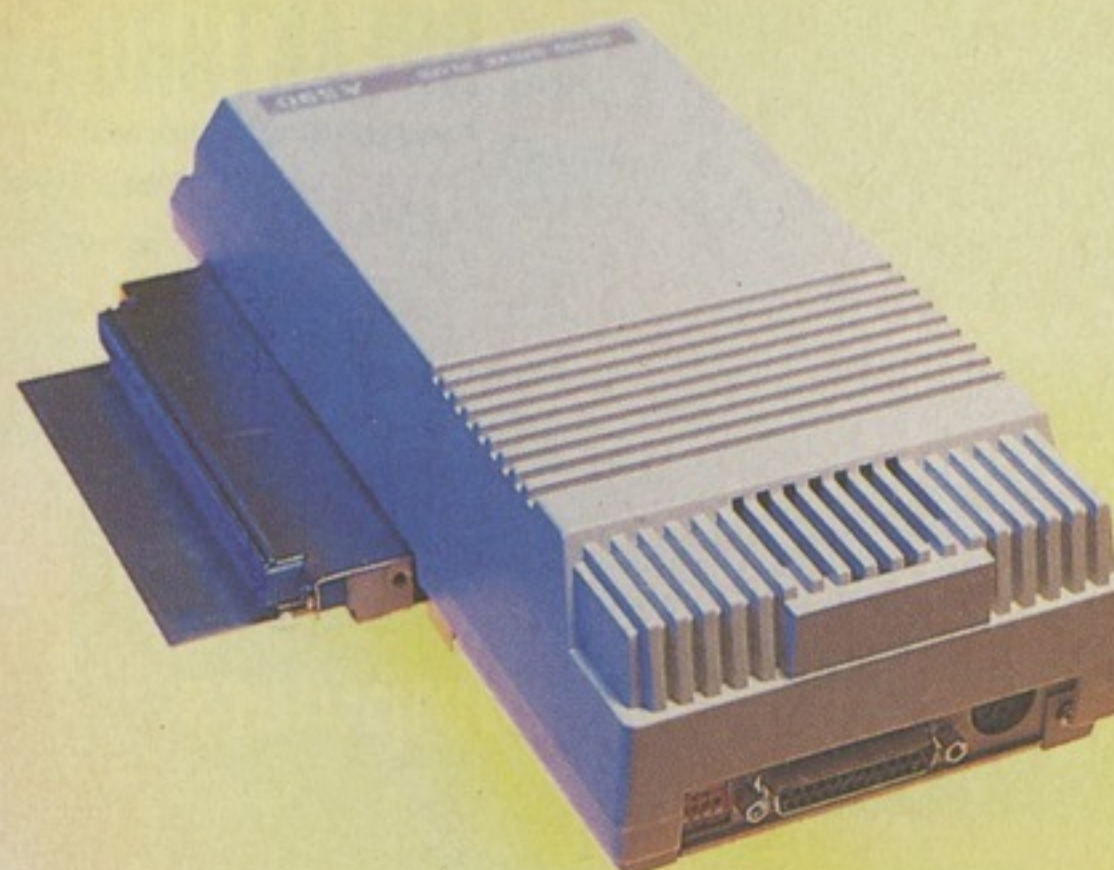
A fast 70Mb drive for £625 from Bytes & Pieces, which also does an enormous 230Mb Amiga drive at £1,499.

GVP 44

A removable hard drive for the Amiga with a high price of £829 for 44Mb of storage.

IMPACT HARD CARD

An internal hard card option for an expansion slot in an Amiga 2000. 45Mb of storage and a whopping price of £816. A smaller 20Mb version still weighs in at £580.



• Commodore's A590 hard disk.

It seems huge, but with a hard disk can come bad habits. Economy housekeeping on your first hard disk looks like a silly idea to begin with, but it's surprising how quickly those files that should have been trashed weeks ago clog the system. This can lead to 'file fragmentation'. A hard disk utilises whatever space is available on the disk for file storage. If you erase a 50K file that will leave a 50K space. When you come to save a 120K file, the disk will look for available space and shunt 50K into the spare space and the rest elsewhere where there's room. So with a crowded hard disk, the same file can be in several pieces.

On a floppy that doesn't matter because there's not

so much space to search through, but with a hard drive it could mean a looking through 40Mb to find a file. Regular use of a utility that sort the files out and places them in single readable lumps can make life easier and access quicker. *PC Tools* contains such a disk compressor, and there are several others on the market

RUNNING APPLICATIONS

With applications getting larger, many now have a routine to install them in a permanent form on your hard disk. This installation procedure usually allows for the specific machine's configuration. Some large applications which involve huge amounts of data will only run on a hard disk. The long access times of floppies and the constant swapping of disks make them too slow or impossible to use.

On the other hand, many games, especially ST and Amiga versions, do not allow you to install them on a hard disk, even if they use several floppies and require constant disk swapping. ■

ST HARD DISKS



• Atari's hard disks are syled to match the Mega ST range.

With a built-in SCSI port, the ST is well provided for with hard disks, but the prices are still above their PC equivalents.

ATARI MEGAFILE 30.

The standard Atari ST hard drive. 30Mb of storage from an Atari-badged box that will match the rest of your kit with a price of £573.

SUPRA20

A 20Mb hard drive at slightly under £481. 30Mb and a 10Mb version with a removable disk also available.

TC240 HD

£2,170 buys you this huge 240Mb drive for the ST. The manufacturer, Third Coast Technologies, is renowned for bespoke systems. An Amiga version is also available.

TRIANGLE TURBO3

A 20Mb hard drive for £399 with a 48Mb option at £499

ARCHIMEDES AND BBC

The Acorn stable is well catered for with the BBC B and Master attracting the addition of hard drives. The BBC B found use in industry as a rugged test machine with analogue/digital converters, and its use as a data gatherer soon demanded hard support. The Acorn Archimedes and A3000 computers were designed with hard drives in mind.

TECHNO HARD DRIVES

Technomatic sell BBC B hard drives and Archimedes disks in various configurations. Prices start at £343 for the Archie and £459 for the BBC.

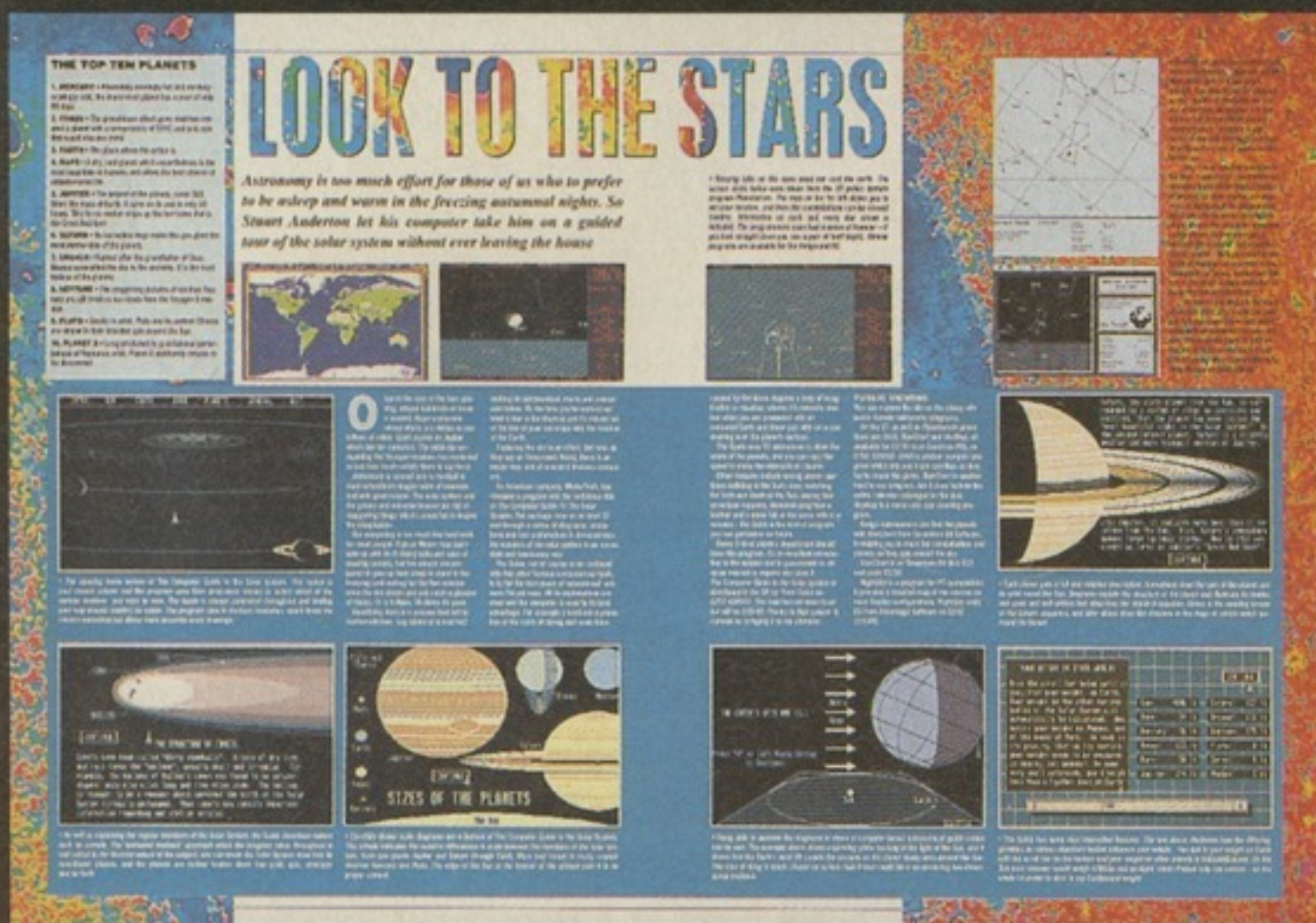
WATFORD DRIVES

Watford Electronics offer a 20Mb hard drive for the A3000 at £424.

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Looks have always been associated with computing power. Indeed many credit the success of the original IBM PC to its ability to 'look the part'. Even though the machine often became nothing more than an expensive desk ornament, no image-conscious businessperson could afford to be without it.

Of course these days no one is fooled by how 'powerful' a computer looks (it's benchmarks we want), but it's still nice if your computer looks good – how else are you going to impress your friends? One computer that certainly isn't going to win any beauty competitions is the Amiga 500 – there's no point beating about the bush, the Amiga 500 is one ugly beast (letters of complaint should be sent to the normal address).

DIY CORNER

In the short time since its announcement, Checkmate's Amiga A1500 kit has caused something of a stir among Amiga A500 owners. For those of you who haven't heard about this piece of kit, it is a rather neat DIY case that promises to turn your Amiga 500 into a true stunner in the looks department – complete with slimline system unit and detachable keyboard. Not only that, but the kit takes the expansion capabilities of your Amiga A500 up to and beyond that of an Amiga B2000.

The basic A1500 kit comprises of a set of two steel casings to hold the Amiga 500 PSU and keyboard. Even before assembling your A1500, the first thing you will notice is the sheer ruggedness of the whole affair – this thing really is tough. Both the keyboard and PSU casings are handmade from steel. Although only avail-



• The A1500 adds a smart new case and expansion ports to an A500.

THE DESIGNER AMIGA

able in bog-standard cream, Checkmate may be willing to produce the A1500 in other colours later (it is currently considering producing a version in black for all those Amiga owners who yearn for a NeXT machine!).

Before worrying about the expansion capabilities on offer (see the box Expanding Horizons), the immediate advantages of the A1500 are obvious. Firstly, the Amiga's internal disk drive is brought around from its present (and ridiculous) position to face the front – just think, no more fiddling around the side of your machine in an attempt to find the disk slot. For gamers, the position of the joystick and mouse ports will make life considerably easier as they now live at the front of the

The A1500 kit for the Amiga offers an upgrade to B2000 standard at a fraction of the cost. Jason Holborn put the pieces together...

machine (*à la* 2000). If you've got a second drive, or a 3.5-inch hard drive such as Commodore's A590, the A1500 includes space to mount the drive internally.

The A500 keyboard now lives in its own casing which is connected to the PSU via a curly cable. To avoid having to carry out modifications to the existing keyboard hardware, both the drive and power lights have also been brought across to the keyboard case. It

would have been nice if these had been moved to the system unit, but that would have required you having to get out the old soldering iron.

DO THE CONVERSION

Turning your Amiga 500 into an A1500 is simplicity itself and shouldn't take much longer than half an hour at the most. All you have to do is to open up your Amiga 500 (note that this will invalidate any warranty that you may have left), remove the PSU, keyboard and disk drive from within the A500 and move them across into the A1500 kit. For those of you who break into a cold sweat at the thought of such things, you'll be glad to know that no soldering whatsoever is required – a screwdriver at your side is all you'll need.

CONCLUSION

£230 is a lot of dosh to hand over for an attractive box. If you do buy the A1500 kit for the sole reason that you want to make your Amiga look nice, then you will be wasting a lot of money. However, for Amiga 500 owners who wish to expand their machines and take advantage of the range of specialist 2000 cards, the Amiga A1500 is a must. If you're considering upgrading to a 2000, forget it – buy yourself a 1500 kit instead. ■

The A1500 base unit costs £230, and the OverRider is £250. The two together cost £480 and a kit to convert to a rack mount costs £30. Contact Checkmate Digital on 01-923 0658.

EXPANDING HORIZONS

The basic A500 was never designed as a machine to be expanded to the kind of levels possible with its workhorse brother, the 2000 – just a single edge connector and a space for a RAM expansion allow for a minimal amount of growth. While this is more than enough for most of us, try to take the A500 any further and you'll start to run into problems.

The basic A1500 unit has provision for a single expansion slot which can either be a 100-pin 2000 slot, an 86-pin A500 connector or a 2000 processor slot. Although not fitted as standard, an Amiga 2000 video slot can also be added, but this will have to be done by

Checkmate as it requires a fair bit of soldering to be carried out.

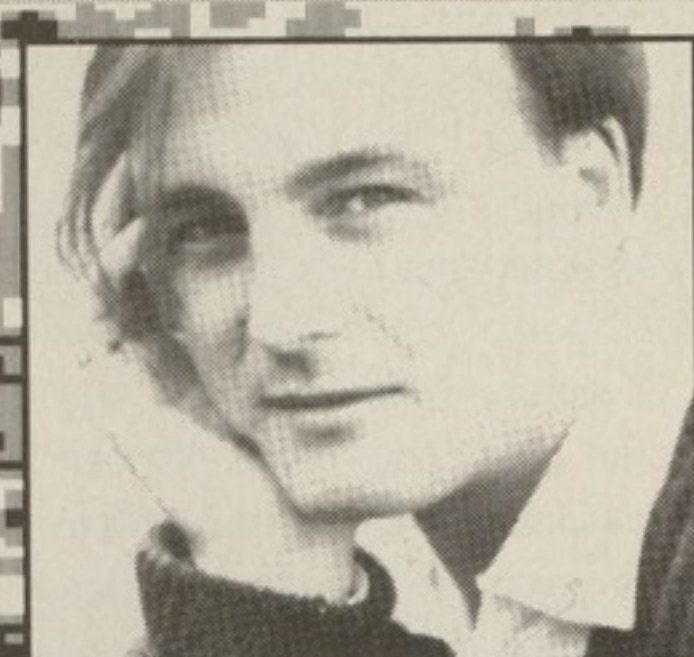
A video slot allows your Amiga to take advantage of such wondrous devices as the Microway's Flicker Fixer and NewTek's Video Toaster.

The fun really starts with the addition of the A1500 OverRider box, which is a card cage which fits snugly on top of the A1500. The OverRider provides a further three expansion slots which can be configured to any combination of the three types mentioned above. Up to three of these little beauties can be added, to take the expansion capabilities of your A500 way above that of a standard 2000.

Although both the A1500 unit and the OverRider will happily handle the PC Bridgeboard cards, neither features PC slots – rendering the Bridgeboard practically unusable.

Musicians will love the extras that Checkmate has to offer. Not only can a MIDI interface be fitted internally, but the whole caboodle can be modified to mount in a standard 19-inch rack along with your synthesiser sound modules and other professional music products. With a rack-mount Amiga and quality software such as KCS 3 and Music-X, can any musician afford to ignore the Amiga?

TECH TIPS



■HELP! RAMmed home!

In *Express* 74, you printed my letter about me asking you which was better – the Atari STE or the Amiga. The letter took a little while to be printed and I had by that time lost all hope of my favourite agony uncle being able to give me sage advice before the fact. (What, Uncle TT forsake one of his *Techtipers*? Never! – Unc).

I thought: 'James, you're going to have to make your own decision'. A little while later I bought the Commodore Amiga. I managed to scrounge up the money by selling my darling Sega Megadrive and keyboard. I also stretched to a Star LC-10 and the *Kindwords* word processor, both of which I have found simply outstanding!

I am very pleased with the Amiga but would now like to take advantage of the nice printer and word processor by adding some extra RAM memory to my machine. I am thinking of purchasing 0.5Mb upgrade. Is there anything I could plug into the back of the machine as I don't fancy taking the lid off and invalidating my guarantee?

James Wheddon, Holbury, Southampton.

All's well that ends well – as someone once said. You plumped for the Amiga and are happy with it.

There are plug-in RAM cards that don't require any modification or case opening on your part (a very good idea as in most cases – as you so rightly say – the guarantee will be invalidated by unauthorised opening and tampering).

One of the best upgrades available is that marketed by George Thompson Associates of Dippen, Brodick, Arran, Scotland; Tel: 0770 82234.

George Thompson is a reputable dealership which supplies a vast range of add-on toys and software for the Commodore Amiga and the RAM cards from this firm are second to none in terms of price and quality.

Fitting is a simple matter of removing the sliding plate covering the 'user port' and plugging the card in. Reassembled, the machine now sports a full megabyte of RAM (useful for really big word-processed documents and scrummy picture files).

■HELP! Take control

I recently purchased a Star LC-10 colour printer for my Commodore Amiga computer. I am pleased with the unit as I feel it is good value for money. However, I am hav-

Does your PC keep packing up? Is your Amiga less than friendly? Would your ST try the patience of a saint? Write to Uncle Tech Tip, he'll see you right. Send your sorry stories to Uncle TT, 30 Monmouth Street, Bath BA1 2AP. There's a prize for the most pitiful tale

ing trouble sending escape codes to it to enable such things as quadruple-sized printing of letters and numbers and to access all of the other options that can be achieved with escape codes.

The software program that I am using at the moment with the printer is *Scribble* which came with the original version of the *Works!* package. The Star printer manual and the *Scribble* manual both state that this escape codes printing can be done, but I have as of yet been unsuccessful. I have set the printer in preferences to Epson JX80 and have tried the dip switches in the printer in both the UK and USA positions without success.

Please could you advise me as to how I might go about solving my problem by printing an example of an escape code and how to implement it?

Paul Gardener, Maidstone, Kent.

Are you sure that the Star is truly Epson JX80 compatible? Of course you can't be, and although I agree that the JX80, being a colour printer, is probably the closest to the Star LC-10 colour, it's doubtful whether all packages will work when using the JX80 printer driver.

Unfortunately, I am sorry to say that there is no simple answer to your problem. Many ways exist to send control codes (or escape codes as you call them) to the printer. Usually, you would use a driver and never have to come into contact with them.

Occasionally, when writing BASIC and other programs you might use the codes directly or when a program provides the option to type in the control codes for some obscure printer. For example from BASIC, you'd need something similar to the following:

```
10 LPRINT CHR$(27);
20 LPRINT CHR$(xx)
```

The first line sends the ASCII code for 'escape' (27) and warns the printer of an impending instruction code. The second line sends the instruction proper where xx could be an instruction to perform a reverse half line feed, change colour, enter bit image graphics mode and so on.

What you must do, is to search through the Star's manual to locate the correct codes for the actions you wish to perform and then type them into the *Scribble* program as and when required

– does *Scribble* offer a 'build printer driver' function? This process is laborious I'm afraid, but probably the only way to achieve the effects you desire.

■HELP! Beeb PD?

I have been considering setting up a Beeb public domain library for some time, and the letter from Dan Samways (*Express* 74) finally convinced me to do so. Before I can start it going, however, I need a large amount of good software.

So, if I might presume upon your good nature, genius, wit, charm and various other attributes (*flattery will of course, get you absolutely everywhere* – Unc) to print my full address, I should like to appeal to all the Beeb programmers out there to send me any software they want to be distributed freely among their fellow Beebites, thereby helping to bring peace, goodwill and happy ever afters to the land of Acorn.

DFS format 40- or 80-track 5.25-inch disks would be preferable, but other formats and cassettes can be dealt with. Include a stamped self-addressed envelope and when the library gets going, I'll

■HELP! Little Bo PPC and the power source



• A mains power supply is almost essential for running the PPC, but be careful with the DIY!

I have an Amstrad PPC640 computer that I am very pleased with. Recently however, the power supply decided to be naughty, crackled, popped and died and although I know that the computer can be run off batteries, it costs a fortune! Each set of batteries runs to many pounds, and any program that uses a lot of disk accessing ensures their demise within a very short space of time.

I am handy with a soldering iron and I've built several electronic circuits in the past so I decided that I'd like to have a go at building a

PPC power supply. The construction part is easy, it's just that I don't know what the DC output of the old transformer was (I threw it away) and so don't know what specification to build the new to. Could you tell me this information?

A Plunkett, Consett, County Durham.

Simple! The PPC power transformer outputs a DC of 13 volts and 1.9 amps. And let me just ask you to be extremely careful when tinkering with projects involving mains electricity supplies.

return the disk with some wondrous program or other on it as well as a catalogue.

Also, can I include software downloaded from a bulletin board in the library without obtaining permission from the board concerned? I assume that as it is on a bulletin board in the first place the software is already in the public domain and therefore OK to use, but I'd like to be sure.

Rafael Jay, Bath, Avon.

You assume correctly young man. Any software that you download from a bulletin board will almost invariably be in the public domain (I say almost invariably, because someone may have uploaded a program he or she had written especially for exclusive use by the callers to the board itself, although this is extremely unlikely).

You ought to be careful when downloading software that it isn't cracked and pirated software placed there without the Sysop's knowledge – this does occasionally happen.

HELP! Keyed up

I have a problem with my Commodore Amiga 500 computer. The soft reset works OK by gently pressing the keys when the machine first switched on, but after being on for a while, the soft reset doesn't work.

I have to press the keys quite hard – anything up to half a dozen times – and sometimes I have to use a fourth key such as the right Shift and press more than once. The Amiga is a replacement under guarantee and brand spanking new. I've had it for four months (the previous machine's internal disk drive gave up the ghost). Also, I wonder if it was over use of the alcohol cleaner or my smoking that clogged the old one up?

I had the machine 11 months and was just inside the one-year guarantee. Also my 0.5Mb memory upgrade won't work with this new machine. Would it have been possible to blow the CMOS chips when I removed them from the old machine?

My understanding of CMOS ICs is handle them with care until soldered in a circuit and then they should be OK. Your opinions would be greatly appreciated.

D Magill, Cheltenham, Gloucester.

The problem is almost certainly one of a dry solder joint on the mother board. When first switched on, the Amiga is cold and the solder tracks are fine, but once the machine has been operating for a little while and the mother board is warm, a cracked or dry joint will expand and stop conducting signals.

By pressing the keys harder or pressing extra keys, you may be forcing the joint back together and making it possible to conduct the signals from the keyboard once more. Of course this is merely conjecture and you really must take the machine along to a reputable (and officially approved) service centre for thorough testing.

Silicon chips are extremely prone to static electricity (the sparks that fly when

you remove a nylon sweater or shirt) and can be damaged simply by handling. Unless you earth any static charge retained by your body, by touching a cold water pipe or radiator, it is highly likely that you will pass on a large amount of electricity to the circuit and frazzle the chips.

HELP! Bad contacts!

I have an old rubber-keyed 48K Spectrum and a Wafadrive tape drive attached to it. When I plug in the Wafadrive and plug in the power to the Spectrum I get the Spectrum logo at the bottom of the screen as normal.

If I try to initialise the Wafadrive however, by typing in NEW* then pressing [enter], all I get is a flashing '?' after the NEW* command. This also happens if I put Interface 1 and a Microdrive on the Spectrum.

I have Interface 2 with a test cartridge by Sinclair, and if I use this, everything checks out OK. I've also tested the Wafadrive and Microdrive on a friend's Spectrum and they work OK.

W A Yates, Churley, Lancs.

When the Spectrum flashes a '?' at you it's saying that it doesn't recognise any device attached to it that can be controlled by the command NEW*.

Literally translated, this means that it doesn't recognise the Wafadrive or Interface and the microdrive.

You've tried all three of these devices with a friend's Spectrum and they worked perfectly well, which must mean they're in working order. This series of deductions leads me to believe that the problem is with the Spectrum's edge connector.

This type of connector is notoriously unreliable being quick to become oxidized and unable to conduct signals. Everytime a device is pushed onto the edge connector a small amount of the gold coating on both the connector itself and the device's connector is scraped off never to be replaced.

After a lot of use and no cleaning, the edge connector becomes almost completely unusable and very often gives up the ghost altogether.

The fact that you have Interface 2 and only a test cartridge (thereby ensuring that the device isn't used very often) explains why that interface will work when the others won't. Its connector is still fresh and tight fitting and manages to set up a good connection with the Spectrum.

Sounds awful? Well the situation isn't quite as bad as all that because you can clean the edge connector simply and restore its conductivity. You'll need a small amount of solvent such as methylated spirit and some cotton swabs (both available from virtually any decent local chemist shop).

Dip the latter in the former and run over the effected surface until bright and clean looking. Restore the connectors of the various devices in the same way. Once cleaned, the Wafadrive, Interface 1 and the Microdrive should all work quite happily again.

Periodically, use a swab and spirit to clean the connectors to ensure they don't go down at a critical moment.

HELP! DMP on Amiga

Please could you tell me how I connect my old Amstrad DMP2000 printer to my new Commodore Amiga? I don't think it is a

simple matter of a lead although I could be wrong as I don't understand interfaces.

Any help would be much appreciated because I have a redundant printer at the moment.

J Hone, Middlesex.

Often after upgrading, computer users find they're left with lots of redundant kit that they can't sell or use. In your case, however, the latter situation certainly isn't true.

The DMP2000 can be connected quickly and easily simply by purchasing the a standard parallel printer lead from any one of the thousands of suppliers vying for your cash in the pages of Shopping Express.

A suitable lead should cost around £10-£12. To ask more is unreasonable and to pay more is foolish.

TIP Tutor for sale

Re: Tech Tips (*Express* 74). J C Keilaus wanted to know if he could get a COBOL tutor for his studies. Well, Colbar Public Domain/Shareware of 10 Penwood Close, Westbury, Wiltshire BA13 3LW has just such a tutor.

It's on two disks and is called *The COBOL Tutor* v1.0. Two 5.25-inch disks will cost a non-member £1.50 each (£2.50 for 3.5-inch format) – post free.

For anyone who might be interested in joining, membership is offered at the cost of £10 per annum, and disks for members are available at the fee of £1 and £2 for 5.25-inch and 3.5-inch formats.

Additionally, the good people at Colbar keep an extensive library of PD and shareware disks to hand simply as a matter of course.

G A Jenner, Swanley, Kent.

TIP The drive dilemma solved before your very eyes

With reference to *Express* 70 and the letter from Jonathan Guyver regarding upgrading his PCW8256 to a two drive specification.

If his reference to projects in another magazine is what I think it is, he might be pleased to know that one of the tables in the September 1987 article is faulty.

For some reason it only lists 12 of the 13 connections which are needed to construct the interface. As it stands the table will only allow formatting and verifying tracks one and two 80 times each! The connection for the direction on both 3.5-inch and 5.25-inch drives is not given.

Having eventually managed to install a 5.25-inch drive on my Amstrad PCW8256, I can reveal that pin

10 is the missing detail for 3.5-inch drives. If Mr Guyver was fitting a 5.25-inch drive, I could tell him the pin on that unit also.

However, the article in the November 1987 edition of the magazine did manage to reveal that item.

Unfortunately, Mr Guyver is opting for a 3.5-inch drive and these do not seem to be mentioned.

To determine the connections for a 3.5-inch drive, he will have to do as I did for the missing pin on the 3.5-inch drive, namely go to a suitably knowledgeable engineer and pay a few pounds for the engineer to look up the details in his or her guide sheets, in which case it would be best for Mr Guyver to wait until his 3.5-

inch drive arrives so that he can quote serial numbers, etc.

Although Mr Guyver is opting for a 3.5-inch drive, whereas I opted for a 5.25-inch device, I would be happy to assist him or anyone else performing the operation. (*There's an offer worth the price of postage. Write to J Vickers c/o Unc TT, and I'll pass it on – Unc.*)

If Mr Guyver or anyone else wishes to construct an interface to connect a PCW to a basic drive unit I can assure him or her that if soldered properly, then the task is a doddle and very satisfying economy over the posh, plug-in-and-go commercial units.

Anyone who can't solder properly could go to next season's electronics evening classes and do the job there

with the help of a tutor.

However, if Mr Guyver wishes to acquire cheaper disks, I am surprised he opted for a 3.5-inch drive.

Although the 3.5-inch disk format is about a quarter to a half the price of a CF2 disk, and has the advantage of being the format which the industry boffins currently favour – and will for a while yet if economy is the only consideration – 5.25-inch disks are the best option.

At £18 to £30 for 100 disks and a no quibble guarantee, they have to be the best buy and a format which is good for a few years yet.

A deal, perhaps, until the new smart card and CD ROM options become available at sensible prices!

J Vickers, Herne Bay, Kent.

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ROM rumpus

Where did you get your information for the news story on the SAM Coupé recall? I would check your sources again, as you have made several mistakes.

The Coupé is not being recalled. True, replacement ROM chips are being issued, but they are being sent direct to the users. The user can either fit the chip him/herself, or take it to the nearest MGT dealer for them to fit. Either way, the machine does not have to be sent back.

I hope you can clear up these details in the next issue of *Express*. The information you gave could put people off the Coupé, and it should be rectified as soon as possible.

Kenny Anderson, Dunfermline, Fife

We didn't say anywhere in the story that the machines would have to be sent back. At the time we ran the story, MGT's position was that fitting by a dealer was the likeliest option.

For the latest position see the story on page 5 of this week's *Express*.

El addiogram

REFERENCE EXPRESS 75 STOP MIS-PRINT PAGE 66 STOP BLACKPOOL STOP SHOULD READ HULL CITY STOP BEST REGARDS ANDREW WHITTAKER END

ARE YOU AND POMFRET BOTH COMPLETELY WITLESS QUERY COME ON YOU GREENS EXCLAM END

Take a memo

Does anyone at *Express*, or do any of your readers, know whether any Memotech MTX User Group is still functioning? Is there any remaining source of tape software for this machine?

A Jones, Tiverton, Devon

Now you come to mention it, we haven't a clue. Perhaps readers can help out? If all else fails, I am told that if you keep your eyes peeled for a second-hand disk drive for the machine (apparently £20 would not be an abnormal price) you could run any disk-based CP/M 80 software. It may well be worth your while giving the CP/M User Group a call on 0753 868196.

Bull baiting

I have a BBC B, with 32K of memory, but I'm sure I get as much pleasure programming and playing games on it as any ST, Amiga or Archimedes owner.

However, I'm not stupid enough to go round claiming my computer is superior to these machines. I recognise they are all faster, have more memory and so on.

John Torofex, in the QL column (*Express* 73), is, it appears, this daft. The very suggestion that a six-year-old, 8-bit machine is somehow superior to a 32-bit RISC machine half the age is both ridiculous and arrogant.



I am not suggesting he should go out and buy an Archimedes tomorrow - far from it. But he should recognise, particularly as a columnist in a widely-read magazine, that his machine, like every other one, has its shortcomings and is not as good as machines developed since.

Jeremy Benson, Bedford

I am not at all ashamed to say that my Latin is terribly rusty, but unless I am very much mistaken *taurus* means 'bull' and *faex* means 'dregs' or 'excrement'. I do not think you should let yourself get too wound up by a man with a name like Torofex...

Smooth driving

Further to my recent letter advising that my Cumana disk drive would not work with my STE, I contacted Cumana who advised that Atari, as usual, had made a slight change to the STE without their knowledge and the drive would have to be altered.

He asked me to return it to them and, since only recently bought, they would fix it free of charge. This is the way to conduct a business and gain more custom. If only Atari would take a leaf out of Cumana's book.

Hope this is of help to other STers.
S Carnegie, Glasgow

Certainly makes a change from a desk full of I Can't Get No Satisfaction letters. I am sure other STE types will take note.

Piracy points

Isn't it time that computer magazines like yourselves started taking practical measures to combat piracy. We already know:

1. There will always be computer pirates. Even if the prices of software came tumbling down, the act of going into a shop and buying a game, nowhere near compares with the thrill and challenge of hacking/pirating a game off your own back and, possibly, making a profit from it.
2. There will always be hardware companies creating cartridges and the like, capa-

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ble of copying and hacking into software and, whatever the good intentions of these companies may be, they know in the back of their minds that these products will be used just as much by hackers and pirates as they will by software developers, professional or otherwise. Indeed, it is probably true to say that they need the people who illegally copy software to make these products financially viable.

3. Computer magazines generate money by selling advertising space.

Our point is, is it right that any computer magazine, especially a magazine with such a high profile anti-piracy stance as *Express* should be advertising one of these cartridges in full colour on the back page, as was the case with *Express* 75? In fact, we doubt if any magazine that preaches anti-piracy and sells to the general public should be advertising this sort of product at all.

This particular product, and it is by no means the only one of its kind, sounds like Long John Software's dream come true.

• Will produce copies of your disk in around 50 seconds.'

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Who, apart from a professional developer, publisher or duplicator, is really that bothered about the speed at which they can reproduce disks?

Who, without any programming expertise, apart from a few professional publishers, graphic artists, musicians and computer PR companies, would have any reason to want to copy a piece of software in the first place?

Who, with the exception of a professional duplicator, would have any need to copy an MFM file from one disk to another, surely this is only necessary when copying a previously protected disk?

The answer to all these questions, apart from a few exceptions, is the same one - a computer pirate.

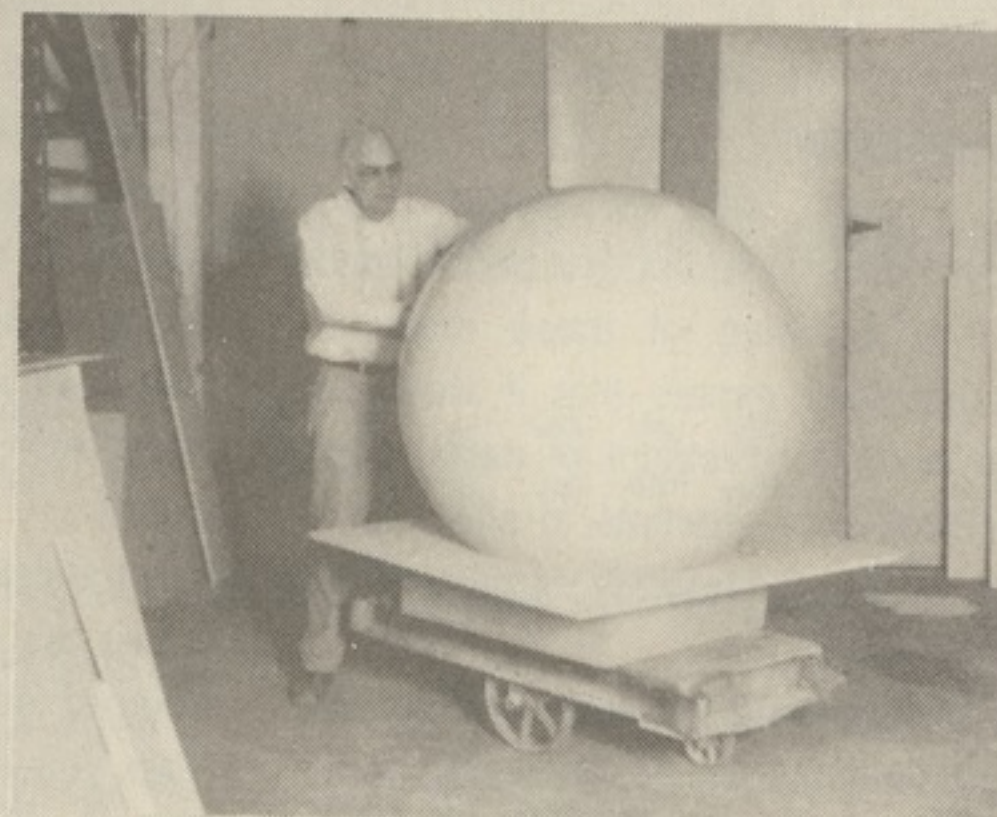
Software piracy is illegal and rightly so, but it strikes us that before piracy will start to dwindle, the promotion of these products to the general public must stop. It is up to the magazines that so readily>

But does the staircase squeak?

'Ere, how come that 'world's largest computer' thing has got stairs and my ST hasn't? Is an add-on stair module planned that will fit snugly into the cartridge port and, here's the biggy, will it be compatible with the STE?

May the blessings of a thousand camels bring your trousers plentiful good fortune.

The Android, Rhyl, Clwyd



• Mr Buster Peripheral wheels out his big ball.

You really are as mad as a balloon aren't you? Still, your letter does afford me the perfect opportunity to print another photograph

of work in progress on the Boston Computer Museum's gigantic walk-through PC.

Here then, for your

edification and astonishment, is a mind-boggling snapshot of Mr Buster Peripheral and his large trackerball.

condemn piracy to make a firm stand and stop advertising the tools of the trade, so to speak.

The only legitimate place for these adverts is in business-only publications, such as *CTW*. Although there is no guarantee that all the sales generated from such magazines will fall into totally legal hands, at least it would insure that the availability of these cartridges will be confined to those people who, on the whole, have it in their best interest to use them only in the legitimate and desirable way.

The prime asset of the particular cartridge advertised on the back of *Express* 75 is that it can mass duplicate protected software very quickly. This, clearly, is useful to the casual computer user for one purpose above all others – piracy.

Sensible Software, 2 Station Approach, Station Road, March, Cambridgeshire, PE15 8SQ.

I have passed your thoughts on to our publisher, whose thankless task it is to determine advertising policy.

For my own part, though, I will say that I think this question is something of a moral quagmire rather than the clear-cut situation you propose.

I note that you are not calling for the manufacture of these devices to be made illegal, nor their supply to the trade or public. So apparently it is all right for someone to make this equipment, advertise it to all the shops on *Computer Trade Weekly's* subscription list (it is, after all, principally a magazine for retailers) and sell it to those shops; it is all right for those shops to display it prominently in the window and advise punters to buy it, but wrong for advertisements to appear in *Express*.

Frankly, I believe that if pirates feel these machines are of use to them and can legally buy them, then that is just what they will do. Magazines not taking advertisements will merely produce a very short delay in pirates knowing the devices are there to be bought.

Net result? Piracy figures are massaged down for a few days and in the mid-to-long term there is no more tangible result than not advertising crowbars or glass-cutters would have on the burglary statistics.

I suspect that the trade and anti-piracy bodies have not grouped to lobby for the outlawing of these machines because they expect that it would be ruled as unfair restraint of trade. If so, then back-door attempts to stifle advertising them would surely come to much the same thing.

In short, I believe that what you are asking for is a cosmetic answer to something which deserves deeper consideration. Readers are, as ever, welcome to contribute other views on the subject.

■ Dodgy contacts

Over the last few weeks I have replied to several adverts in the Shopping Express contacts section and I must admit that I am

horrified at what I have had back and how blatant the adverts now seem. It seems to me that there can't be much checking out of adverts on your part.

The most obvious adverts to stamp out are those mentioning the word 'Automation'. Automation is an ST Group that specialises in cracking, packing and distributing commercial games, up to four or five games per disk. From one of the 'contacts' I received a list of around 200 such disks by them and other groups.

In my experience, anyone asking for a 'software list' most certainly does not want a list of original disks, and the same applies for 'swapping software'. Not only games but programs like *Calamus*, *Pro-24* and, of course, *Autoroute* are readily available from these people.

I know that *Express* is strongly against piracy but, instead of just saying so every so often, isn't there anything more practical you can do? Stopping the pirates advertising for contacts is one thing but that sure wouldn't stop them doing their stuff. The only idea I can come up with is to give them a bit of a scare, like getting FAST to send them an official-looking letter or something. Something has to be done.

I would rather remain anonymous because there are a few people who wouldn't like me writing to you like this.

Anon

This is one of several letters I have received to this effect. But for a contrary point of view, see the following letter...

■ Personal plea

You are considering dropping the personal column from your free ads owing to pirates using it for illegal transactions.

Since you started your personal column I have replied to five ads asking for contacts and I had a number of replies when I placed an ad myself. Out of these, two were pirates who wrote to me to enquire about swapping software. I answered the remaining 11 and we regularly write to each other.

Also, I placed an ad in *Express* to sell some of my software when I was briefly unemployed. The result of this was that I received five phone calls from people offering to sell me copied software from as little as £2 per disk (with each disk containing 'up to eight titles'). Am I to deduce from this that you will also be stopping the sales ads because pirates are using these?

I am an ST owner and my favourite games are strategy/simulations. This fact alone is enough to put most pirates off. Have you ever tried playing *Red Storm Rising*, *Dungeon Master*, *Falcon*, *F16 Combat Pilot*, *Silent Service*, *Gunship*, *Zak McKracken* etc without the benefit of the manuals?

Re-consider your decision regarding the personal column. The contacts I have made are good friends and I have even visited one that lives close to me; had it not been for the personal column I would

never have met this person.

Most correspondence with these friends is, of course, ST related. Also, if one of our group buys a program and considers it to be a great simulation, then the rest of us will buy the program so we can correlate and exchange information and then jointly finish the game.

My final point: New ST users will be writing to contacts advertised in *Express*. I believe that if these youngsters get in touch with people like myself, then once they find out how interesting it can be to be part of a group of real enthusiasts dotted around the country, we will be able to

steer them away from piracy. I'm not saying this will always be the case but, obviously, if a person buys an ST and decides he wants to pirate software, then he is going to do it, whether or not you run your personal ads.

Please do not discontinue your personal ads section because a few people abuse a good service. Thank you.

C D Palmer, Jarrow, South Tyneside

So there you have it – two opposed but equally valid opinions. For my view, please turn the page to have a look at this week's Comment – page 8.

■ How to create error-free databases

I read, with interest, your recent article (*Express* 74) entitled 'DIY Databases' and, on the whole, would agree with most of the points raised by it. However, I feel I must speak out on the coverage of the subject of error checking.

Yes, error checking is absolutely necessary but – slapped wrists Tim Smith – the suggested method could only lead to more trouble than it's worth.

The code fragment appears to work correctly, until more than just one or two errors have been detected (this will vary, depending on the make of machine and type of BASIC used).

On some BASICs, the problem may go completely unnoticed for quite a long time, but show it surely will. In fact, some BASICs would (fortunately) not even allow this piece of code.

There is only one proper way to exit from a subroutine, and that is with a RETURN statement. The error checking routine disobeys this cardinal rule (bad style and programming practice) by using a GOTO to jump directly out of the boundaries of the subroutine. This will leave a return address on the control stack which will never get used (a waste of memory).

Furthermore, this coding won't actually do what its author says it will either (ie '... the subroutine can be used again and again...') because the subroutine will always jump back to the routine to input the 'date of discovery' (in the example) when an error is detected! The usefulness of the routine becomes debatable on this point.

To clarify I'll recite a few simple rules I was taught at college, which apply equally well to all computer languages which allow subroutines:

- 1) A subroutine should always have one, and only one, RETURN.
 - 2) The RETURN should never occur in an IF-THEN statement.
 - 3) The RETURN should be regarded as the end of the subroutine and, as such:
 - a) No GOTOS should send control to any part of program after it.
 - b) No GOTOS occurring after it should send control to it.
 - c) No matter what happens within the subroutine, the RETURN should execute.
- A suggested form of the code fragment shown could be:

```
10 REM INPUT DATE
20 LOCATE 10,10: INPUT "Date of discovery DD/MM/YY ":date$
30 GOSUB 1000: REM CHECK DATE FOR ERRORS
40 IF baddate=-1 THEN PRINT CLS: GOTO 20

1000 REM CHECK DATE FOR ERRORS
1010 baddate=0
1020 IF LEN date$<>8 THEN baddate=-1
1030 RETURN
```

Although this method is longer and involves a little more typing, it avoids the problem I mentioned above and is also much better programming 'style'. This leads to much more maintainable programs and also makes de-bugging a whole lot easier.

Note the REM statements. I make it a personal rule to always comment subroutines in this manner, as it makes things much clearer; how will you be able to remember what the routine at 1000 does, in a year's time or even a week's?

In writing this letter I am, I must emphasise, not just having a moan. For the most part I enjoy reading *Express* (it's lively, energetic, outspoken, informative and even humorous) and there are those fab free classifieds (end of creeping). I just thought that I ought to do my citizenly duty of pointing out a potential pitfall, which might discourage the attempts of starters in the field of computer programming.

Andy Jewell, St Judes, Plymouth

As Timmy reckons that most of what you say is fair comment, and I can't even program my VCR without getting home from my holidays and finding I have recorded the test card, who am I to argue with you?

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A selection of computers which perpetrate disasters from the copious annals of Mel Croucher

THUNDER BAY, CANADA

A coroner's inquest examines the suspected murder of Gerry Urchel, a 37-year-old miner. Urchel is pulped when he is deliberately pushed off a ledge and falls 24 metres to his death.

After examining the evidence, the court rules that the murderer is a computer-controlled scoop tram, but there are grounds for diminished responsibility. Its logic chip had been driven insane by rogue radio signals.

(*Kitchener-Waterloo Record*)

ALLSTATE INSURANCE, USA

The Allstate Insurance organisation begins to build an \$8-million computer system in 1982. It is intended to totally automate the company's business, and the completion date is assured as 1987. The system overshoots both the budget and the timetable, but the actual figures are not too far out. Today's estimated completion date is 1993 at a cost of \$100 million.

(*Business Week*)

MOSCOW, USSR

Sergei Abramov is a boffin at the Soviet Academy of Sciences who develops a PC virus shield to protect Russian computers against all known viruses. "This protective system has no counterpart in the world," says Sergei. Eighty PCs proceed to become infected - it takes 18 hours to clean them out. The virus is traced to a group of foreign schoolkids attending a computer studies program, who are using the machines to pirate games software for their Russian chums.

(*San Francisco Chronicle*)

CAMBRIDGE, ENGLAND

It is well known that the Sinclair QL fails to appear within the advertised time limits, and that punters fret about their mail order monies left rotting in someone else's bank account. Advisers to Sir Clive Sinclair are

called in to think up an idea that will mollify the angry public, and suggest a barrage of Freepost addresses to disseminate the latest excuses.

What is not so well known is that one enterprising soul organises the frustrated public into a guerrilla warfare squad. They mail unstamped packages containing house-bricks to the Sinclair Mission Control, where the unfortunate manufacturer has to pay for the privilege of receiving enough masonry to build a modest garage.

(Bruce Everiss)

JOHANNESBURG, SOUTH AFRICA

23-year-old Renata Espach works in the computer room at Liberty Life. The facility is protected by 1.5-tonne steel doors with fail-safe optical sensors and automated safety controls. She enters the room and is about to hand over a document to a colleague, when the doors crush her to death. The document she is holding is a life insurance policy.

(Associated Press)

TYNESIDE, ENGLAND

A housewife finishes two years' probation for conning a mail order computer. The software is supposed to scan the names of customers for known debtors and suspect applicants, but fails to spot that the entire cast of *Coronation Street* apparently reside at the lady's home address.

Despite none of these fictitious characters paying for any of the goods ordered, the computer continues to authorise new orders from the same address, care of 'new' customers such as John Travolta and Olivia Newton-John.

It is not reported how the woman's criminal activities are discovered, but how she has spent the two years' probation is well documented: she has been training to write self-monitoring mail merge software.

(BBC Radio 4)

NEXT WEEK

LEARNING PACKAGES

Commodore's Class of the '90s and Acorn's Learning Curve compared

SEXISM IN COMPUTING

Fighting the boy's own image of the microprocessor

SPECTRUM MUSIC

It can be done! Making music on the SAM and Speccy explained

AMIGA MUSIC

The Quartet sequencer reviewed

PLUS

- The Shopping Express guide to the best Amiga software
- Tech Tips: technical advice with the human touch
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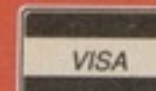
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